GAS JOURNAL

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VOL. CCXII.

OCTOBER TO DECEMBER, 1935.

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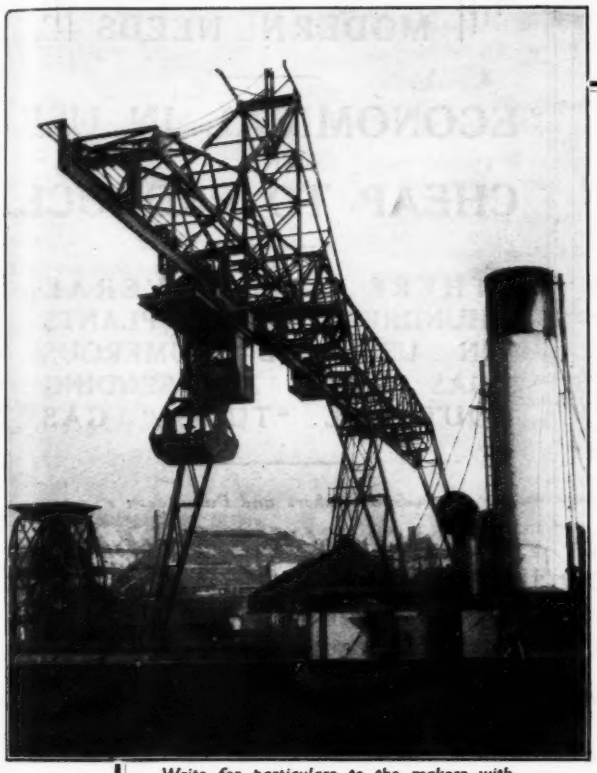

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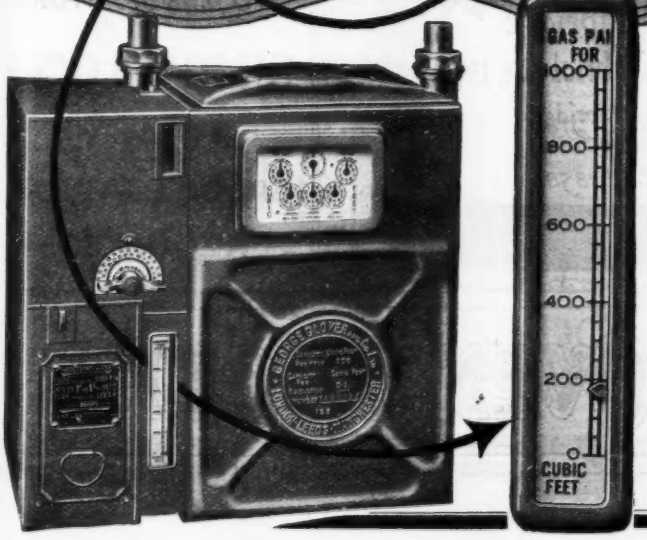

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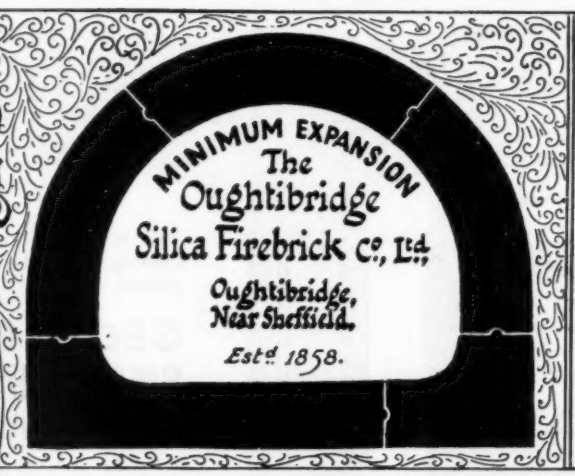

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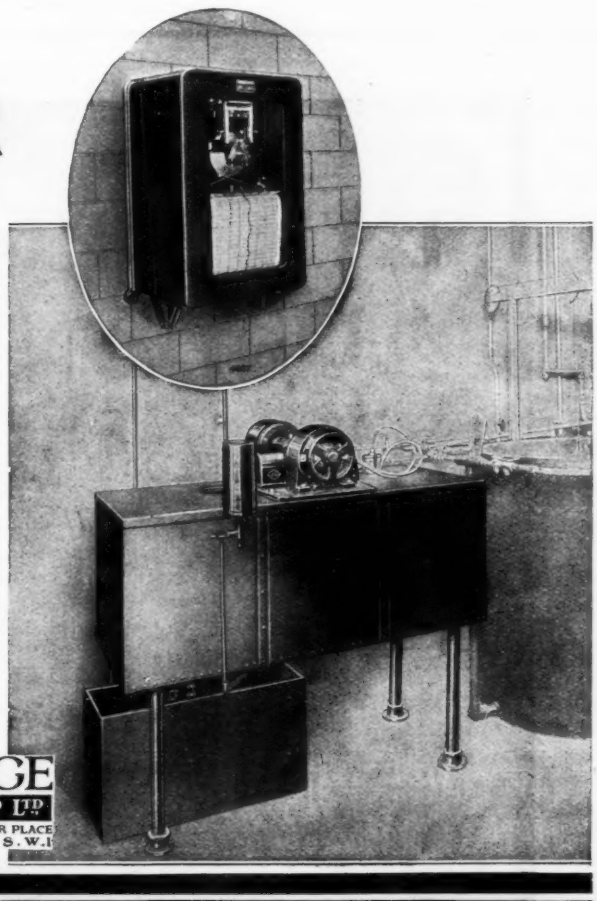

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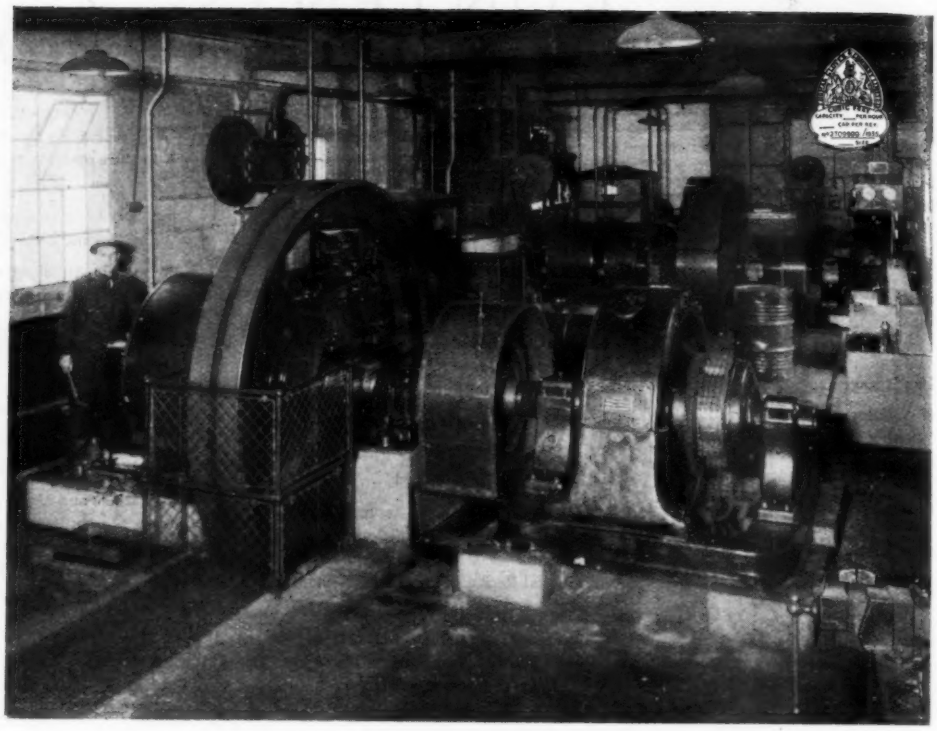

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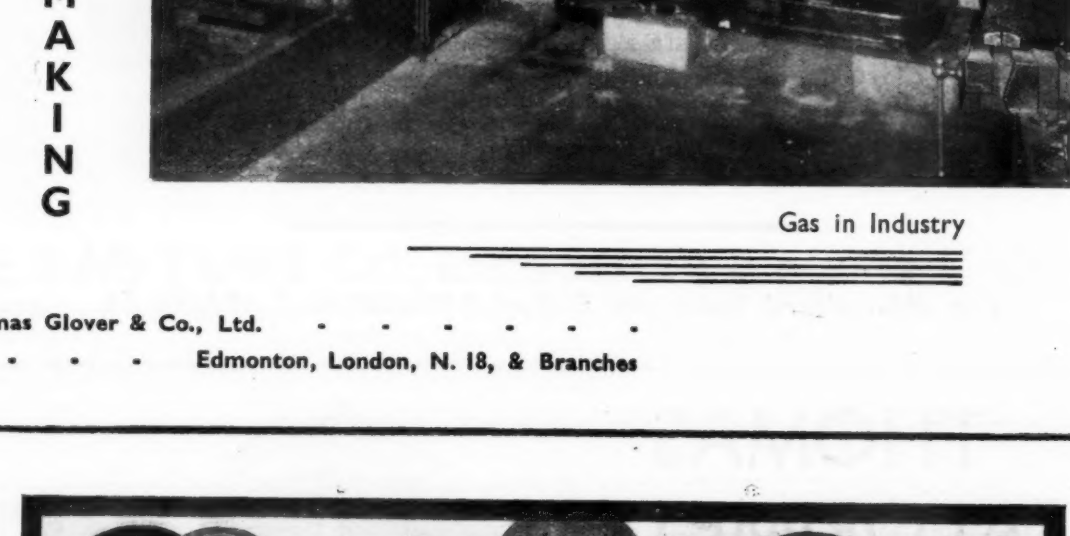


Gas Journal

OCTOBER 2, 1935

Vol. 212. 87th Year No. 3776

Editorial Notes

Make It Known

THE picture of the Gas Industry which Councillor Muter gave in his Presidential Address to the British Commercial Gas Association on Monday last is one which should be more widely known and more continuously exhibited. As members of the Gas Industry, aware of its magnitude and its place in the Nation's economy, we are too apt to think that " outsiders " share our view. This, however, can never be unless we constantly, by unremitting effort, keep the activities, the developments, and the possibilities of our Industry in the forefront of the public mind—and in this expression we include politicians, members of local government, economists, and industrialists. On many of our platforms we are speaking to the converted. Councillor Muter had a platform from which to address the general public, for which reason alone his Address must have had singularly good effect. At a time when eyes appear to have but one focal point—the darling electricity—it was certainly opportune. Conferences of the British Commercial Gas Association, which obtain such widespread publicity on such general grounds, constitute a most important part of the Industry's progress. They are conferences which take our consumers into our confidence; and this we must do more and more. We have a fascinating story to tell; let us be proud to tell it.

We certainly have reason for particular pride in the developments which have taken place since the War, and especially during the past decade. During the last ten years we have increased our consumers by a matter of 2,000,000, so that now practically 90% of the population of this country is using gas for one purpose or another. We suggest that, even to-day, few of our 10,000,000 consumers are aware of how gas can serve them and at what low cost, or of the apparatus which the Industry has to offer on terms which make them available to all. And this service is the outcome of a process *par excellence*, which conserves the Nation's chief asset—coal. For years we allowed the public to feel that we cared nothing about their custom—that they were, in fact, honoured to have a supply of gas. This deep-seated feeling is not yet wholly dispelled, and it works a deal of harm to the progress of gas in the home. It will be eradicated only by greater attention to efficient salesmanship and " service after sales." Impressing this fact, Councillor Muter in his Address also explained what measures we are taking to satisfy the needs of the public, whatever their station in life. Progressive salesmanship, he observed, is essential. The worth of adequately paid and trained salesmen to the Industry is as yet only partially realized. We put " paid " before " trained " because it is quite useless to expect young men to undergo training if at the end their prospects are thin and the value of their work is minimized. Any sales organization depends on the human element, on those who are directing plans and those who are putting them into operation. Platitudinous, perhaps; but the Gas Industry has been slow to perceive it.

Service in Edinburgh

OUR Industry is better organized than ever to face the competition of to-day and to-morrow; this organization from the publicity and selling point of view was dealt with by Councillor Muter, who rightly called attention to the vast field for gas in industry and to the vast accumulation of industrial experience of the Gas Industry which is available to the manufacturer. We are glad, too, that he shares our view that the Gas Industry is essentially a great chemical industry and did not confine his attention solely to gas. That the Gas Industry is a great chemical industry—that many valuable products accompany the manufacture of gas when coal is processed at a gas-works—should be more firmly impressed on the public mind and especially on the minds of our legislators. It is a fact which will have an all-important bearing in linking-up our Industry with future chemical developments and will make our Industry still more indispensable. Councillor Muter's references to the work of the Edinburgh Gas Department on the production of oil from coal—which work is being carried out in conjunction with the Fuel Research Board—and to the provision of solid smokeless fuel for the open firegrate are very much to the point.

Councillor Muter explained the attitude of the Industry to its consumers and indicated ways in which it might improve its service. Among these ways, greater exercise of the co-operative spirit is unquestionably not the least important. The Gas Industry must be a unified whole, and in this connection what the President had to say about the question of municipal control of public utility undertakings will, we hope, be closely noted—and borne in mind. He emphasized the need for rescuing these undertakings from changing policies frequently dictated by outside influences. " A public utility under the direct ownership and control of a municipality should," he observed, " be entirely free to develop itself along strict commercial lines consistent with its service to the community. The subsidizing of local rates from the profits of publicly owned concerns is to be deplored, and however specious the arguments in its favour may be, I

consider it to be a vicious principle. In short, municipally owned public utilities should be entirely freed from the slightest vestige of party or political influence, so that they may be immediately responsive to the needs of the consumer and the changing habits and customs of our social life. There is abundant room for further enterprise on the part of numerous municipalities. A municipality which controls the local gas supply is failing in its duty if it does not seize every opportunity of increasing its activity. This can only be done by intensive and untrammelled work." With all of which we are in hearty agreement.

A Good Year's Work

THE Annual Report of the General Committee of the British Commercial Gas Association, which was submitted at the Annual Meeting in Edinburgh and is published on later pages, makes encouraging reading. It is an account of considerable development in the Association's activities, made possible by a larger income from the higher rate of subscription and also because undertakings throughout the country are more and more availing themselves of the help which the Association is in increasing measure so well equipped to give. Realizing the growing intensity of competition and the paramount need for bringing to the notice of the public the services which gas can offer, the majority of undertakings in the country have given their full support to the Association's work. There remain, however, undertakings which are not appreciating their responsibilities not only to their immediate consumers but to the Gas Industry generally, and are not paying their full share in the co-operative work which is so essential to success and prosperity of the Industry. While the Report just presented is the most satisfactory in every way we have yet had, it is impossible to rest content until every undertaking is pulling its weight. Even then the contentment will not imply any trace of complacency; it will be an incentive to further endeavour. Greater endeavour is, indeed, the keynote of the Association's Report.

The period covered by the Report has certainly been a busy one for the Association. The National Kitchen-Planning Competition, for example, produced some 23,000 entries and unquestionably stimulated interest in gas—excellent propaganda. And as for contact with the Press, the Association's Press Bureau has supplied material and illustrations for about 1,500 articles which have appeared in newspapers and magazines circulating among a wide public. Editors are willing to accept news items concerning gas which have " reader-interest;" and in this connection we emphasize once again how desirable it is that members should let the Association have news of local activities while this news is " hot." It is not a bit of use expecting publicity for an event already past. What pleases us as much as anything about the Report is the greatly increased demand for the services of the Publicity Department for local use. National propaganda must be backed by local publicity, and this local publicity can be made all the more effective by calling upon the help of the skilled organization at Headquarters. Again, never before has there been such a demand for window and showroom displays, posters, exhibition sets, and so on prepared by the Association's Display Department—a demand which led to the occupation of new premises by the Department, where, in larger surroundings the work is being extended. In this connection a scheme for the periodical interchange of displays between undertakings in the same district has been evolved and has met with a favourable response. On more than one occasion we have pointed to the desirability of such area co-operation.

A further phase of organizing for the future which stands out prominently in the Report concerns means of interesting our womenfolk in gas and the advantages it affords. To which end the twelve months under review has seen the formation of the Women's Gas Council, the activities of which should receive the support of every gas undertaking, and also the proper planning of the Home Service Department of the Association. We have no doubt that as time passes the work of this Department in developing good customer-relations will be of more and more importance. Altogether the Report of the General Committee of the Association indicates the spirit of keenness and enterprise which is abroad, and it is upon this attitude that the future prosperity of gas depends.

Research

IN the " JOURNAL " for Sept. 11 we commented on the suggestions put forward by Dr. E. W. Smith in the Silver Jubilee Number of *West's Gas* concerning the organization of the Gas Industry's research. Dr. Smith contends that the control of research in the Industry should be much more widely held than it is at present, and that the proper body to control it is the British Gas Federation. Not that the B.G.F. should undertake research directly, but that it should put gas on a par with other industries by sponsoring the formation of a British Gas Industry Research Association, which would be financed from the central bodies' general fund. Such a scheme, he hints, might encourage greater support from the contracting side of the Industry—the Society of British Gas Industries—because their members would on this vital question of research meet others in common counsel on an equal footing.

There is, however, another and a very important aspect of the matter, and this is that the Treasury, through the Department of Scientific and Industrial Research, would in all probability subscribe to such an association as it does to the research associations run by other industries. In regard to such associations we were interested in a leaflet distributed on the stand of the Department of Scientific and Industrial Research at the Shipping, Engineering, and Machinery Exhibition which closed at Olympia on Saturday last, and at which, of course, the British Gas Federation had such an impressive display. " Controlled by Industry, Encouraged by Government " —this is the title of the leaflet giving briefly the aims and objects of Industrial Research Associations and indicating the extent to which the scheme has developed. " Begun as a bold experiment in industrial co-operation," states the leaflet, " the Research Association Movement is now an established success, and has become an integral part of British industry." The associations are " self-governing bodies formed on a national basis in various industries for research in the industries they serve." Several of the assocations, it is pointed out, have special sections whose duty it is to explain the bearing of the results of scientific work to member undertakings. The staffs of these sections visit members' works to inform them of the latest results and to discuss at first hand their practical application.

There are now eighteen research associations actively at work under the scheme launched by the D.S.I.R., and it is significant that among the industries are those of electricity and coal. As Dr. Smith mentioned in the article to which we have referred, the British Electrical and Allied Industries Research Association is the largest research association and presumably draws the largest grant from the Treasury. Whether or not we should organize our research in such a way as to benefit from Government assistance and at the same time foster greater co-operation from the contracting side of our In-

dustry, is certainly, we repeat, a question for full consideration. Dr. Smith, as we have pointed out, put up his suggestion on what might be termed "neutral territory," but needless to say the "JOURNAL" will be only too pleased to give a platform to those who find objections to his ideas. It is a matter upon which all viewpoints should be clearly understood.

The Wales Meeting

INDIRECTLY, of course, the Gas Industry *has* benefited by a grant from the Treasury to assist research. We refer to the work of the British Refractories Research Association. Incidentally it was largely through the financial support of the Gas Industry that the D.S.I.R. decided to help the Association. In an Address to the Wales and Monmouthshire Association of Gas Engineers and Managers Mr. A. T. Green indicated to what extent our Industry has been aided by this research and how it is likely to benefit from investigations now in progress. An abstract of Mr. Green's Address will be found on later pages, and it is obvious that the money we have expended on the investigations carried out by the B.R.R.A. is insignificant compared with the money we have been able to save by the increased knowledge of refractory materials which has been gained. The simple tests which have been formulated for the testing of refractory materials have been of the utmost value to the gas engineer in his selection of different types of refractory for different uses. A case in point is the application of the after-contraction or expansion test, which has resulted in an improvement in the texture of firebricks and silica products—and texture is all-important—and an increase in the maximum temperature of the firing operation. It has helped to pave the way to a fuller appreciation of the constitution of silica products. Guiding data have been obtained which have proved fundamental to our conception of the structural stability of high-temperature installations.

One other point from the Wales and Monmouthshire Meeting calls for at least passing mention, if only because it got the Gas Industry into the daily Press headlines. We refer to the strong plea of the retiring President, Mr. Harold Barker, for cheaper gas appliances, which unfortunately was seized upon by at least one daily paper in a manner which can only have given the public the impression that somehow or other they are being charged too much for their gas appliances. We feel sure Mr. Barker would agree with us that such a repercussion is not in the least helpful to anybody. In any case the whole matter of the price of gas appliances is of the "hardy annual" variety, and one which we have discussed at length on several occasions. Some gas undertakings say they are able to sell purely "on quality," which obviously is the ideal; others, again, say it cannot be done; possibly local circumstances, as regards competition, social conditions, and so on, are the main factor as between these two viewpoints. In any case, we still believe that the intense competition which exists between the various makers of appliances is the best safeguard that the Industry—and the public—can have, and that it accounts for the constant introduction of new and special features without any increase in price. At the same time it is only fair to remind Mr. Barker, and many others who side with him, that not so long ago the wages of many engaged in appliance production were raised, that the prices of some of the raw materials have already risen, and the prices of others are showing much greater tendency to rise than to fall. At the same time, we join with him to the extent of asking for the very best appliances at the lowest possible price.

Promotional Tariffs

A WEEK or two ago we were able to announce in our columns a revision—and a singularly interesting one—of the attractive domestic tariff introduced by Mr. C. R. Ingham at Brighouse two and a half years ago. At the same time changes have been made in the scales for commercial and industrial purposes, but we are concerned here with the domestic charges. The basis of the scheme was to make generally available gas at a price competitive with solid fuel, to which end a block system was adopted which afforded quick and substantial relief after the consumption of a comparatively small quantity of gas. The first 1,000 cu.ft. per quarter was charged at 4s. 6d. per 1,000 cu.ft., the next 2,000 block at the considerably reduced price of 3s. per 1,000 cu.ft., and all in excess at the very low price of 1s. 8½d. per 1,000 cu.ft., which corresponded to 4·05d. per therm, and which obviously offered the salesman a first-class opportunity to promote sales.

Such a scheme meant in the first place an increase in price for the first block of 1,000 cu.ft., and, of course, met with opposition when it was brought forward at a meeting of the Town Council. The argument was advanced that the new tariff would place undue hardship on the small consumer—the 1,000 cu.ft. and less per quarter type. It was pointed out, however, that only 80 of such consumers were on the books and that they were not necessarily "poor." Quite a proportion consisted of those who were using a gas supply purely as a convenience and could in fact well afford to pay the 4s. 6d. asked for. Moreover, if the unremunerative consumer did have to pay a little more for his gas, the increase, in view of the small amount he used, was correspondingly slight. Anyhow, the scheme went through, greatly to the benefit of Brighouse gas consumers.

The new tariff was well advertised in the local Press, backed up by special and striking leaflets delivered to every householder in the town. It was clearly pointed out what the reduction of price meant, and what services could be had, on tap, with gas at 4·05d. per therm. Every meter inspector and gasfitter was instructed in the details of the tariff and its operation; and it was explained to prepayment consumers how the material concession in price enabled them to rent new appliances—water heaters, fires, and so on. Since the introduction of the tariff sales of the Brighouse Gas Department have shown an increase of 8% during a period when all too many undertakings have registered a decline. And, what is of the greatest significance, this growth in sales is being accelerated.

Now let us turn to the revision of the tariff a short time ago—admittedly a bold revision, but one well justified by the previous results of offering a real incentive to the consumer to avail himself of gas service. The scale now reads: For the first 10 therms per quarter, 9d. per therm; for the next 5 therms, 7·2d. per therm; all in excess of 15 therms, 3·24d. per therm. In other words, all the salesman has to do is to say to the consumer, after you have consumed gas to the value of 10s. 6d. you can have your further supply at 3¼d. a therm. This is what we term a *promotional* tariff. At this price gas can compete on terms of direct cost with solid fuel for water heating and space heating. It is a price which offers untold possibilities, and we have no doubt that before long Mr. Ingham will have an interesting account to show of the results of this commendable enterprise. In the meantime he is by no means losing sight of the propaganda value of gas at 3¼d. per therm. In the local Press he is running a series of well drawn up advertisements prepared by the British Commercial Gas Association, while in his showrooms is a special display

featuring the same story. Interchangeable panels tell the public what services they can enjoy with gas at 3¼d. a therm, and link up with the Press advertising. The Brighouse Gas Department are going out for business—and they will get it.

Long Service

In this issue we begin a series of articles for which we are indebted to the co-operation of a number of firms whose names are household words in our Industry. "Long Service to the Gas Industry" is something which a great number on the "contracting and manufacturing" side can justly claim to have rendered, and our own view is well known—that such service, rendered in many instances continuously from generation to generation by the same family, has played a part, the value of which is difficult to overestimate, in the development of the Gas Industry to its present state of technical efficiency on both manufacturing and utilization sides.

In striving towards that mutual goodwill and working to one end—the welfare of the whole Industry in its service to the nation—which are the ideals behind the recent formation of the British Gas Federation, we feel that mutual appreciation of one anothers' services by all sections of the Industry is almost the first essential. The series of articles in which we have invited old friends to relate their histories is an endeavour to assist towards this end. We feel certain that they will contain a vast amount of interest for all our readers, and especially, if we may say so, for the rising generation, who, after all, cannot be expected to recollect as we do (editorially speaking) the continuity of service of many firms whose names are taken for granted to-day.

We ourselves have kept the chronicle of the Gas Industry for close on 87 years with a completeness which nobody else has attempted, or, indeed, had any need to attempt, since our weekly record has for so long been taken for granted to a degree in which often enough the reward is honour rather than peace and plenty. But our own long service, also from generation to generation in one family, does enable us to recall, by written record as well as tradition, how many of the famous names of to-day were already to the fore in the very early days of the Gas Industry.

We would not conclude this note without expressing our gratitude once again to those who have co-operated in this series. To any reader who may wonder whether significance attaches in any way to the order in which articles appear we can reply in advance that by general consent the sequence emerged literally from the Editor's hat, and not from his literary (*sic*) head.

Forthcoming Engagements

Oct.

3.—Midland Junior Association.—Presidential Address of F. L. Atkin.
4.—I.G.E.—Research Executive Committee, 2.30 p.m.
5.—Manchester and District Junior Association.—Meeting at Preston. Presidential Address of Mr. A. K. Collinge.
5.—Scottish Eastern Junior Association.—Presidential Address of Mr. A. J. Doran.
7.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 1.45 p.m.; General Purposes Committee, 3.15 p.m.; Benevolent Fund Committee of Management, 4.30 p.m.
8.—I.G.E.—Council, 10 a.m.; Gas Education Committee, 4 p.m.
8.—N.G.C.—Central Executive Board Meeting, 2.30 p.m.
8.—Federation of Gas Employers.—Central Committee Meeting, 11.30 a.m.
9.—National Joint Industrial Council for the Gas Industry.—Meeting at 28, Grosvenor Gardens, S.W. 1, 3 p.m.
9.—B.G.F.—Meeting of the Council at 28, Grosvenor Gardens, London, S.W. 1, 10.30 a.m.
9.—I.G.E.—Gas Education Executive Committee, 10 a.m.; Council, the British Gas Federation, 10.30 a.m.; Board of Examiners, 2.30 p.m.
12.—Scottish Western Junior Association.—Presidential Address of Mr. A. Bujnowski.
16.—B.C.G.A.—Executive Committee, 11 a.m.
17.—B.C.G.A.—Midlands District Conference at Wolverhampton.
17.—Eastern Counties Association.—Autumn Meeting at the Stanton Ironworks Company, near Nottingham.
17.—Southern Association (Eastern District).—Meeting at 28, Grosvenor Gardens, S.W. 1.
18.—Manchester District Association.—Meeting at Midland Hotel, Manchester, at 2.30 p.m.
18.—London and Southern Junior Association.—Presidential Address of J. M. Webber.
19.—Scottish Junior Association.—Joint Visit to Thomas Glover & Co., Ltd., Edmonton.
22.—I.G.E.—Gasholder Committee, 2.30 p.m.
25.—Western Junior Gas Association.—Meeting at Bristol.
29.—B.C.G.A.—Eastern District Conference at Peterborough.

Nov.

4.—B.G.F.—1st Annual General Meeting, Grosvenor House, Park Lane, London, W. 1, 3 p.m.: 2nd Annual Dinner, Grosvenor House, Park Lane, London, W. 1, 7 p.m.
5.—I.G.E.—Council, 9.30 a.m.; Council, 4.30 p.m.

Nov.

5 and 6.—I.G.E.—7th Autumn Research Meeting at The Institution of Mechanical Engineers, Storey's Gate, St. James' Park, S.W. 1.
6.—Manchester and District Junior Association.—Visit to Prescot. Paper by Mr. F. N. Booth and Mr. J. Fletcher.
7.—S.B.G.I.—Council Meeting, 11 a.m., followed by the Autumn General Meeting.
7.—Midland Junior Association.—Meeting. Paper by Mr. R. G. Marsh.
12.—I.G.E.—Gas Education Executive Committee, 4 p.m.
14.—Midland Association.—Autumn General Meeting, Grand Hotel, Birmingham.
14.—Southern Association (Eastern District).—Meeting at 28, Grosvenor Gardens, S.W. 1.
15.—London and Southern Junior Association.—Annual Dinner.
19.—I.G.E.—Session at the 8th Public Works, Roads and Transport Congress and Exhibition, Royal Agricultural Hall, London, N. 1, 3 p.m.
22.—London and Southern Junior Association.—Meeting.
29.—I.G.E.—Liquor Effluents and Ammonia Committee, 11.15 a.m.; Joint Research Committee, 2.30 p.m.

Dec.

3.—I.G.E.—Research Executive Committee, 2.30 p.m.
4.—Manchester and District Junior Association.—Visit to Birkenhead. Paper by Mr. A. J. Walker.
5.—Midland Junior Association.—Annual Dinner.
13.—London and Southern Junior Association.—Meeting.
14.—Scottish Western Junior Association.—Meeting and Address by Mr. W. D. Rowe, of the B.C.G.A.
21.—Scottish Western Junior Association.—Annual Social.

The Royal Wedding and the Institution Research Meeting

In view of the Royal Wedding on Wednesday, Nov. 6, 1935 those attending the Annual Dinner of the British Gas Federation on Monday, Nov. 4, and the Autumn Research Meeting of The Institution of Gas Engineers on Tuesday and Wednesday, Nov. 5 and 6, are advised by the Secretary of the Institution to reserve hotel accommodation without delay.

Personal

At a meeting of the Manchester Gas Committee the appointment was recommended of Mr. SYDNEY HOWARD PACKER, of Bradford, for the post of Assistant to the Controller of Sales and Service. Subject to the approval of his appointment by the City Council Mr. Packer will commence his new duties on Dec. 1.

* * *

Mr. J. C. COTTERILL, Engineer, Manager, and Secretary to the Bude and Okehampton Gas Companies, has been appointed to a similar position under the St. Austell Gas Company, Ltd. He will take up his duties there during the month of October.

* * *

The Cannon Iron Foundries, Ltd., Deepfields, near Bilston, Staffs., announces that Mr. EDWARD J. BRYDEN, Chartered Accountant, has been appointed Secretary to the Company, in succession to Mr. JOHN MASON, who has retired after 54 years' valuable and loyal service, the last 38 years in the capacity of Secretary.

The retirement of Mr. John Mason was marked by the presentation of a chair by the Staff as a token of their esteem and regard. Mr. Mason, who had received gifts on the completion of 50 years' service, was also the recipient of a silver tea service, suitably inscribed, from the Directors of the firm.

* * *

Mr. J. RAWLE, Coke Superintendent to the Wandsworth and District Gas Company, who is leaving to take up a position with the Montevideo Gas and Dry Dock Company, was recently presented with a reflex camera by his colleagues.

* * *

At the Ordinary General Meeting of the Leamington Priors Gas Company on Sept. 24, Mr. R. SYDNEY RAMSDEN, Engineer and General Manager, was elected to a seat on the Board in succession to the late Mr. H. G. Hawkes.

Obituary

Mr. J. FOSTER HALLIDAY, who for upwards of 40 years was Secretary to Messrs. R. & J. Dempster, Ltd., of Manchester, died at his residence at Southport on Sept. 26 at the age of 66 years. For some time his health had not been of a robust character, but he was present at the recent inauguration of the Middleton waterless gasholder on Sept. 18, and at business up to Sept. 21. A sudden chill, developing into pneumonia, was the cause of his unexpected death. His work as Secretary was always a source of satisfaction to his Board of Directors and his co-workers.

* * *

The death occurred on Sept. 24 of Mr. ROBERT WATERSTON, J.P., Vice-Chairman of the Coatbridge Gas Company.

* * *

The death occurred at Elland on Sept. 24 of Mr. C. T. JACOBS, who was well known to many gas engineers throughout the country by reason of his long association with the firm of Messrs. Robert Dempster & Sons, Ltd., of Elland, having been Secretary to the Company since 1899. He was a native of Abergavenny, but went to Leeds at an early age, and was associated with the engineering firm of Messrs. Holroyd, Horsfield, & Wilson until 1891, leaving them to take a position with Messrs. Robert Dempster & Sons, Ltd. He was appointed Secretary in 1899 and a Director of the Company in 1927. Mr. Jacobs, while of a retiring nature, led a very active and useful life, both professionally and socially. His kindly disposition will be remembered by many gas engineers and those who have been associated with Messrs. Robert Dempster & Sons, Ltd., and his interest in local affairs was maintained right up to his death.

News in Brief

Gas Light and Coke Company's New System of Charges

Optional Two-Part Tariff

This afternoon Sir David Milne-Watson, Governor of the Gas Light and Coke Company, announced the Company's adoption of an attractive new system of charging for gas to domestic consumers of all classes throughout their area of supply.

The present flat rate charge in the Company's central area is 8·6d. per therm. The new scale, which is, of course, entirely optional, embodies a standing charge based upon the net rateable value and the number of rooms in the house. For this purpose sculleries, bathrooms, kitchenettes, &c., are excluded. After payment in advance quarterly of this standing charge, consumers receive all their gas at a price of 4d. per therm within the central area.

In the outside areas the new price is arrived at by the addition of 4d. to the differential between the central and the outside area in question. Supposing, for instance, that the flat rate in a particular outside area is 10d. per therm—that is to say, there is a differential of 1·4d. To this 1·4d. is added the 4d., with the result that after payment of the standing charge, consumers in this outside area get their gas for 5·4d. per therm. A higher scale of standing charges is applicable to flats than to houses.

A feature of this new scale is its simplicity and the fact that it can be taken advantage of by all classes of domestic consumers, whether in inner or outer areas, slot meter or ordinary. Contracts for the new scale are applicable for a full year, and are renewable every twelve months subject to one month's notice on either side. In the event of a consumer moving from one area to another or into a larger or smaller house, the standing charge is adjusted to meet the case of the new premises, and a proportionate allowance made to the consumer if the new house brings him under a lower rating.

The two-part tariff is applicable only to domestic consumers, as the Company's industrial users already have the advantage of very favourable block rates.

We shall give details of the new scheme of charges in the "JOURNAL" next week.

At the 10th Annual Exhibition of the Preston Chamber of Trade in the Public Halls, Preston Gas Company had an attractive stand.

Sanction to Borrow £10,000 for prospective expenditure on laying gas mains and services is being sought by the Halifax Gas Committee.

An Exhibit was Staged by the Blackburn Corporation Gas Undertaking at a Brighter Homes Exhibition at Blackburn organized by the Chamber of Trade.

In a Housing Scheme of 156 houses at Leek, Staffs., 50 "Eagle" gas coke insets with self-contained boiler flues and back boilers have been installed by the Leek Gas Department.

A Sales Superintendent is Required by the Weston-super-Mare and District Gas Company. Further particulars of this position which carries a commencing salary of £350 will be found in our advertisement columns this week.

Gas is Strongly Favoured by the tenants of the Market Hall at Bolton, and, when the Corporation decided to eliminate gas and to rely on electricity for all purposes, the Chamber of Trade reported that 95% used gas for heating and cooking. We understand that the Corporation is now reconsidering the matter.

1935 "JOURNAL" DIRECTORY

Page 12. BUDE. J. C. Cotterill, E., M., & S., resigned.
Page 42. LOSTWITHIEL. R. Morton E., resigned.
Page 58. ST. AUSTELL. J. C. Cotterill appointed E., M., & S., vice R. Morton resigned.
Page 58. ST. BLAZEY. R. Morton, E & M., resigned.
Page 64. STAINDROP. In liquidation; production ceased.
Page 80. BUCKIE. W. C. Campbell appointed E. & M., vice P. M. Sim.
Page 108. ORIENTAL GAS COMPANY. W. J. Savage appointed E. & G.M., vice E. Garsed retired.

An Increase of 2·65% in the output for July and August over the corresponding period last year was reported by the Engineer and General Manager, Mr. F. Blackburn, at a meeting of the Plymouth Corporation Gas Committee on Sept. 26.

In Last Week's Issue of the "JOURNAL" there appeared the caption, under Gas Undertakings' Results, Maryborough (New Zealand) which should, of course, have been Maryborough (Queensland), there being no Maryborough in New Zealand.

The Directors of Stothert & Pitt, the engineers and ironfounders, announce the payment of three years' dividend on the 5% cumulative preference shares. This will bring the payment up to June 30, 1935. The last ordinary dividend was 2½% for 1930-31.

The Next Meeting of the Council of the Society of British Gas Industries will be held at the Offices of the Society at 11 a.m. on Nov. 7, and will be followed by the Autumn Luncheon and Meeting of the Society at the Whitehall Rooms, Hotel Metropole, W.C. 2.

Amalgamation and Grouping

Caledonian Gas Corporation and Galston.

We learn from a local correspondent that an offer of 42s. 6d. per share made by the Caledonian Gas Corporation, Ltd., has been accepted by a majority of the shareholders of Galston Gas Company, Ltd.

Severn Valley and Welshpool.

The Severn Valley Gas Corporation, Ltd., announce that their recent offer to shareholders of the Welshpool Lighting and Power Company, Ltd., has been accepted by the holders of a substantial majority of the issued share capital of that Company.

Chambers of Commerce Visit Gas-Works

Lower Sydenham Works Inspected

A visit was paid on Wednesday of last week by members of the Bromley and Chislehurst Chambers of Commerce to the Lower Sydenham Works of the South Suburban Gas Company.

A thorough tour of the Works was made, and all the aspects of gas manufacture and the production of by-products were explained to the visitors by the guides. The laboratories and meter and stove shops were also inspected.

The visitors were subsequently entertained at tea, when Mr. T. W. Gibson (Works Superintendent) welcomed those present. Mr. H. L. Elphick (President of the Bromley Chamber) and Mr. A. A. Bone (Chairman of the Chislehurst Chamber) expressed the thanks of the visitors for the facilities and hospitality kindly provided by the Company.

Mr. G. W. Brown (Joint Secretary of the Bromley Chamber) proposed a vote of thanks to Mr. D. W. Evans (District Manager) for his assistance in arranging the visit, and to the Chislehurst Chamber without whose co-operation the visit could not have been arranged. Mr. Evans briefly acknowledged the vote of thanks, in the course of which he made reference to the extent of the South Suburban Gas Company's activities, stating that the Undertaking's area amounted to 270 square miles, while the number of consumers served was nearly 182,000.

Institute of Fuel

Installation of Sir John Cadman

On Wednesday, Oct. 9, at 11.30 a.m., Sir John Cadman, G.C.M.G., D.Sc., the President-Elect of the Institute of Fuel, will be installed in the Presidential Chair of the Institute by the outgoing President, Sir Harry McGowan, K.B.E., in the Lecture Theatre of the Geological Society of London, Burlington House, Piccadilly, W. 1. His installation will be followed by the presentation of his Address to the Members, and will, we understand, contain some very outspoken comments on the subject of solid and liquid fuels. Members of technical Societies interested in any form of fuel are cordially invited to be present.

The Council of the Institute state that Mr. Harry Ralph Ricardo, F.R.S., has been nominated as the Melchett Medallist of the Institute of Fuel for the year 1935. Mr. Ricardo will deliver the Melchett Lecture at 2.30 p.m. Mr. Ricardo, in his Address, will deal with matters connected with petrol and diesel engines. Members of any technical Institutions interested in the development of internal combustion engines are cordially invited to be present.

City and Guilds Examinations

S.B.G.I. Awards

The Council of the Society of British Gas Industries have again this year awarded prizes in connection with the Examinations of the City and Guilds of London Institute in Gas-Works Practice, Gas Supply Practice, and Gas Fitting.

The list of awards is as follows:

MINOR COURSE IN GAS-WORKS PRACTICE.

Joint 1st Prize	£3	13	6	D. Roberts . . .	Examined at East Ham
	£3	13	6	D. E. West . . .	Examined at Swansea

MINOR COURSE IN GAS SUPPLY PRACTICE.

1st Prize	£5	5	0	A. J. Mollison . .	Examined at Croydon
2nd Prize	£2	2	0	C. R. Winter. . .	Examined at Nottingham

FINAL EXAMINATION IN GAS FITTING.

1st Prize	£5	5	0	G. A. Rammell . .	Examined at Malvern
2nd Prize	£2	2	0	P. Blackhurst . .	Examined at Malvern

United Kingdom Gas Corporation, Ltd.

A Statement of Aims

On other pages of to-day's "JOURNAL" we publish a Notice issued by the United Kingdom Corporation. It does not constitute an invitation to the public to subscribe, but, having been published in the daily Press in accordance with Stock Exchange Regulations, is now reproduced in the "GAS JOURNAL" in order to acquaint the Industry more fully with the constitution and aims of the Corporation.

The fact that Colonel W. Moncrieff Carr, this year's President of the Institution, had joined the Board, was announced in the "JOURNAL" for Sept. 11; other names well-known in the Industry which appear among the Directors are those of Mr. M. H. Tetley, a Director of the Imperial Continental Gas Association, and Mr. Henry Jones, son of Mr. Frank Harding Jones.

The United Kingdom Corporation are anxious that it should be widely recognized in the Industry that their principal object is to group smaller units with the larger units, so that they may be in a position to render service equal in every way to that which can be rendered by the biggest undertakings and to enhance their value to the community they serve and to the shareholders. For example, it is claimed that the Corporation, operating on a much larger scale than independent units, will be in a more favourable position to introduce tariffs, to the advantage of all concerned.

The Corporation intend, where coke oven supplies of gas are available, to link up the neighbouring companies. In all cases, even where coke oven gas is not available, purchases will be made solely with a view to the district grouping of undertakings, in order to secure co-ordination of services. A further objective in the policy of the Corporation is to be the selling of gas on advantageous terms to industry and the concomitant replacement of imported fuel oil.

Athletic and Social

Watford and St. Albans Co-Partnership and Pension Funds.

The Twenty-Sixth Annual Statement of Accounts and Balance-Sheet of the Company's Co-Partnership and Pension Funds for the year ended June 30, 1935, together with those in respect of the Life Assurance Scheme, and the Group Life and Pension Scheme, for the half-year ended June 30, 1935, state that an actuarial valuation of the Pension Fund was made in 1934, and the Directors considered it advisable to close the Fund to further entrants at Dec. 31, 1934. The Group Life and Pension Scheme was commenced on Jan. 1, 1935, and employees, when eligible for membership of the Co-Partnership and Pension Funds, will now be accepted in that scheme. At the same time a Life Assurance Scheme was commenced as an ancillary scheme to the Pension Fund (1928).

Voluntary contributions to the Co-Partnership fund have again increased to over £1,340. Since the commencement of the fund, £1,259 of "A" stock, £19,200 ordinary stock, £2,240 5½% preference stock, and £160 5% preference stock of the Company have been transferred to various Co-Partners. The Pension Fund has grown during the year to £44,101, of which over £38,500 has been invested in Government and other securities.

As usual many excellent collections have been made, and the fine total of £210 has been raised and contributed to local institutions.

Demonstrating in Comfort

The Demonstration Hall

DUBLIN HOUSEWIVES' GOOD FORTUNE

by A. H.

During a recent visit to Dublin, the writer was privileged to inspect the handsome main showrooms and offices of the Alliance and Dublin Consumers' Gas Company, and he has no words other than those of praise in which to describe anything that he saw there, or what he gathered regarding the different services offered.

Dublin consumers are to be congratulated upon the facilities which an enterprising Company place before them, while the Company are equally to be commended upon a far-sighted policy which will keep gas in the forefront, despite any competition that may threaten. These are not exaggerated phrases; they merely recognize conditions that even to-day are less often met with than they might be.

In the main, this recognition must suffice, but there were two features which made special appeal, and which it was felt should be brought more fully to the attention of "JOURNAL" readers. One of these was dealt with in the Editorial pages on Aug. 28, under the title of "Gas Company Make Better Homes"—a title that was fully justified by the facts disclosed. Briefly, these facts are that the Company have a scheme by which, for the sum of £40, they will furnish a home with a complete equipment for cooking, heating, and hot water supply, fitted and left working. This is particularly attractive to the purse-bearer, as it enables him to know "just where he stands."

The second feature relates more to the housewife, who finds herself considered to an extent that may be unusual, though one must hasten to add that it cannot be undeserved. That is to say, the Dublin Gas Company have provided on their premises a demonstration theatre and a café which are an outstanding example of completeness, of comfort—in fact, of luxury. So great, indeed, was the impression credited upon the mind of the writer, that he felt he would be doing less than he should were he not to try to prevail upon Mr. William J. Grey, A.C.A., the General Manager and Secretary, to supply him with photographs and details for publication. These have been courteously furnished by Mr. Grey, and are here reproduced.

The lecture and demonstration hall is in reality a fully-equipped theatre in miniature, with a seating capacity of 270. The stage is complete with curtains, footlights, &c., and there are dressing-rooms provided. The modern kitchen set allows abundance of room for demonstration work.

Great attention has been paid to the acoustic properties of the auditorium, and by the use of four balanced microphones and two concealed loud-speakers the double object is achieved of easy audition for the listeners and absence of voice-strain for the lecturer. The sound-control panel is situated in the operating box, as are the gramophone turntables used for playing records before and after lectures or during intervals.

The footlights, ventilated ceiling lights, floodlighting, and, indeed, all forms of lighting, are by gas, and all lighting controls are duplicated for operation either from back-stage or from the operating box. As a precautionary measure, the theatre is wired for the presentation of talking pictures, should suitable films become available. The "Plenum" system of ventilation is employed, which ensures a flow of conditioned air without fluctuation.

The seating is extremely comfortable, and the whole theatre complies with all local bye-laws; every safety device being embodied. Numbered booked seats are allocated to consumers anxious to attend, and the booking plans are always available for future lectures.

During demonstrations the theatre is in darkness and the stage floodlit, and, in order to obviate the necessity

A Corner of the Café attached to the Theatre

for note-taking, details of the recipes, &c., which are the subject of the lecture are printed beforehand and given to consumers upon arrival.

After the demonstrations, a limited number of teas is provided in the cosy café which is attached to the theatre.

Gas Preferred at Hereford

The Lighting Committee of the Hereford City Council are reporting to the Council that they have considered the scheme submitted by the Shropshire, Worcestershire, and Staffordshire Electric Power Company for the better lighting of St. Owen's Street, and St. Peter's Square, together with the Lighting Superintendent's report thereon and his estimate for the provision of high-pressure gas lighting in the thoroughfares and also Union Street. From the report it appeared that the annual charge in respect of the scheme for electric lighting exceeded that estimated for lighting by high-pressure gas, but that in the case of gas lighting the capital cost would be borne by the Corporation.

They therefore recommended to the Council that the Electric Power Company be given three months' notice to terminate the existing agreement for the lighting of St. Owen's Street and St. Peter's Square by electricity.

THE BRITISH COMMERCIAL GAS ASSOCIATION

THE PRESIDENT.

THE

Presidential Address

OF

Councillor WALTER · MUTER

(Convener of the Edinburgh Corporation Gas Committee)

Delivered at the opening public session of the 24th National Conference of the British Commercial Gas Association held in the Freemasons' Hall, Edinburgh, Sept. 30 and Oct. 1, 1935

It is customary, in the Presidential Address at our Annual Conference, to take stock of the position of the Gas Industry. The Address is not only a general introduction to our specialized discussions; it is also an opportunity of taking our consumers into our confidence. To-day I shall try to outline our plans for the improvement and expansion of our service to the public.

The economic problem of the world to-day is not a problem of production but of distribution. It is a truism that our distributive system has not kept pace with the amazing progress of productive technique.

In the case of the Gas Industry we find that since 1914 the make of gas per ton of coal has on the average been increased by 25% and has been accompanied by an increase in saleable by-products. In the same period a remarkable series of inventions has brought all gas appliances to an unexampled pitch of working efficiency, and has added to our range a number of new appliances. In the last 10 years the number of gas consumers has grown from 8 million to 10 million, so that to-day practically every family within an area of gas supply (about 90% of the population of this country) is using gas for one purpose or other. We are reaching the limit set by Nature or by circumstances to the number of consumers, but we are not yet within sight of the limit to gas sales, not by a long way. Only a fraction of our 10 million consumers is using their gas supply to the fullest possible advantage. It may be doubted whether many of our consumers even know of all the ways in which gas can help to make their homes healthier, more pleasant, and easier to run and at less cost to themselves.

Re-organization and Co-ordination.

Thus the task before the Industry to-day is to develop the gas consumption per consumer and develop it quickly. It may not be an easy task, but why is it difficult? In the first place I regard it as a condition precedent to all other factors that the Industry must seriously face re-organization and co-ordination.

The day of the small uneconomic unit is over and I hope that the movement towards complete re-organization will not be long delayed, also that the changes that are necessary will be inspired from quarters that have the ultimate welfare of the Industry and of the public as a first consideration.

The sales side of our business requires immediate reinforcement. The task involves a scientific study of the needs and habits of consumers in the light of changing conditions and the gradually improving standard of living. It means that the gas supply and gas appliances must be made available to consumers on the easiest possible terms, terms which in former days would probably have been considered uneconomic. These appliances will require to be maintained at concert pitch and consumers must be trained to use them in the most economic and efficient way and to make full use of the automatic controls with which science has provided us.

At one time the Gas Industry considered that it had completed its part of the contract when gas was delivered in pipes at the point of use. Nowadays the Industry is responsible for choosing, testing, and marketing gas appliances.

To-day we are selling, not only a commodity, but a service, and the value of service I rank higher than that of the commodity. As a public utility, it is our responsibility to make this service of ours contribute in increasing measure to the health, comfort, and prosperity of the community. From that point of view, we have a three-fold programme before us:

1. To secure shorter working hours, especially for the woman in the home.
2. To provide healthier and better living conditions for all.
3. To aid in the revival of British industry.

Before we discuss in detail the methods of achieving these aims, let us analyze the present position.

Coal Conservation and Smoke Abatement.

The wealth and health of the British Isles alike depend upon the wise utilization of their coal resources. Our national prosperity, our very existence as an industrial power depend absolutely on the efficient production, transport, and utilization of our coal resources, coupled with our supplies of iron.

The problem is not merely how long will the coal in our coalfields last at the present or even at an increased rate of consumption; it is how long we can win this coal and deliver it to the user at a price that will enable our industries to compete with those of America, Germany, France, and Japan. It is consequently imperative that we should secure the highest possible percentage of economy,

that we should eliminate waste to the utmost in the production, transport, and utilization of coal. The conservation, the wise and economic use of coal is of vital importance to the prosperity and indeed the whole future of our nation. It stands for economy of our material resources. The household grates of this country are responsible for the consumption of more than 30 million tons of raw coal per annum. The abatement of coal smoke which destroys property and costs enormous sums of money, and which above all is the insidious enemy of public health, is hardly less urgent.

These two objectives—coal conservation and smoke abatement—happily go hand in hand. In combination they can be achieved by the same means, and by that means only—the carbonization of coal. It is here that the Gas Industry points the way.

I cannot do better than quote the eloquent words of our own Executive Chairman, Sir Francis Goodenough:

> "I look upon the prospect of an almost smokeless Britain with real and, I believe, well founded optimism. The wastefulness of burning raw coal—no matter for what purpose—is so great that an end to the practice is only a matter of time. It is from the most efficient treatment of coal and the extraction of a maximum thermal and chemical value from it that the greatest contribution to national fuel problems must come. And the most efficient treatment yet discovered is that of high-temperature carbonization as practised at the gas-works of to-day."

The substitution of gas for 17 million tons of raw coal every year has undoubtedly saved millions of hours of work for the women of this country. In addition it has contributed in the conservation of our fuel resources and has helped to clear the air of our towns, and on this account alone commands commendation. A special Committee of the Manchester City Council recently reported that the use of gas has saved the city from an added sootfall of 20,000 tons a year. On a conservative basis it is estimated that the Gas Department of the City of Edinburgh has been responsible for a reduction in sootfall of 12,000 tons per annum.

Gas Equipment—Hygienic, Attractive, and Efficient.

It is clear, however, that there is still immense scope for the expansion of smokeless fuel in our homes. Certainly there was never a more propitious time for advancing the use of gas, the ideal smokeless fuel. The long range and extensive housing schemes which are now in progress all over the country offer a unique opportunity to the Gas Industry. In practically every housing scheme completed since the war gas has been installed for some purpose—generally for cooking and washing, as well as for fires and hot water. (I may add that when gas fires are used, healthy ventilation is ensured. This is a point of topical importance, as a panel of distinguished physicians has recently condemned the practice of building flueless rooms in housing estates, on the ground that it is against the interests of health irrespective of the method of heating.) In my opinion no apartment without a flue is fit for human habitation. Even in the slums at present being demolished flueless apartments were uncommon. Efficient ventilation is the hall-mark of good design in any home.

We must recognize the changing social habits of to-day and the new standards of comfort responsible for certain demands. As one instance I may cite the demand for a continuous hot water service in every class of home. This is a requirement which the Gas Industry is best fitted to meet. Three out of every four women already use gas for cooking. Is there any reason why they should not also use gas for hot water? The same argument applies to other needs of to-day—the need for a higher standard of heating, for trouble-free laundry, for switch lighting, and for refrigeration.

How is the Industry equipped to capture this wider market? As far as the range, variety, and efficiency of gas appliances are concerned, we are well able to meet any competition. Practically every gas appliance we stock is an invention of the last ten years. Automatic oven control on cookers, self-acting water heaters that feed every hot tap in the house, panel fires built flush with the wall, gas pokers, gas irons, gas airing cabinets, and garage and greenhouse heaters—all these are products of recent inventions.

And design has kept pace with invention. Our modern appliances are made to look cheerful as well as to do the work better than it has ever been done before. The enamel finish, clean bright colours, and simple design of gas appliances are helping to transform the kitchens of this country. The plans of the King's House presented by the Royal Warrant-Holders this year show how gas cookers and fires are treated to-day as part of the architectural design of the house, and not as convenient afterthoughts. In this connection I welcome the cordial collaboration that now exists between the architectural profession and our Industry.

The growing efficiency of gas appliances results automatically in a lower consumption of gas. A new gas cooker or fire, for instance, uses far less gas to do its work than a model made over a dozen years ago. This means a loss of gas sales to us—but the loss is being more than counterbalanced by the new uses that are found for gas in the home.

These improvements in the service we offer have led us to replan the distributive side of the Industry. Our programme of expansion involves the use of every up-to-date method of sales and publicity.

In the first place we are concerned to make modern gas appliances available to all. To that end we are offering them on the easiest possible terms. As regards the price of gas itself, I do not propose to anticipate this afternoon's business session, at which the basis of rate-structures will be discussed. But it is not out of place to say here that the Gas Industry is so constituted that the needs of the public come first. Every increase in productive efficiency is passed on to the consumer as an economy.

The law forbids statutory Gas Companies to raise the price of gas without lowering their dividends. In no other industry has the consumer been so fully protected by legislative enactments.

The Importance of Pre-Paid Supplies.

At this point I should stress the great and increasing importance of slot consumers. We have to-day more than 6 million consumers of this type—60% of the total number. They account in the aggregate for 40% of the total gas sales, including sales for industry and public lighting.

These are significant figures. They prove—if proof were needed—that gas is no longer a luxury, but a necessity in every class of home. When we consider the rising standard of living in this country it is well to remember how much of the undoubted improvement is due to the "penny-in-the-slot" meter which allows the ordinary householder to pay his way as he goes.

The future of our Industry depends partly on the insight and sympathy and assistance which we show to slot consumers. They offer an expanding market which as time goes on will respond more and more readily to every improvement in service, and will be correspondingly critical of slackness or inefficiency.

Prudent Administration in Gas Industry.

The consumers to-day in Edinburgh are benefiting from the wise and prudent administration of a former generation. The book value of the Undertaking is over three million pounds while the unredeemed capital amounts to little over £900,000. Assets may appreciate or depreciate according to market fluctuations but the Gas Undertaking of the City of Edinburgh is an asset which money could not really purchase. It is municipalized, it is part of the community, and it earns its dividends by passing on to the consumers a smokeless fuel in a convenient form, indeed a commodity which comes second only to water in our domestic and industrial requirements. Any money or profit earned one year is passed on to the consumer the following year by way of reduced charges.

Since the war the price of gas in Edinburgh has been progressively reduced from 5s. 8d. to 2s. 9d. per 1,000 cu.ft. coupled with a sliding scale for quantities used, the minimum price being 1s. 6d. per 1,000 cu.ft. or 3·78d. per therm. Further reductions or modification of the scale of charges are under review and the financial position of the Concern is so favourably consolidated that it is possible that in the immediate future gas will be available at prices hitherto unthought of. It is already below pre-war price, a compliment which cannot be paid to many of the materials used in its production.

The same fortunate position is apparent throughout the country and the many reductions in price which have been published recently indicate that the Gas Industry has firmly established itself as the one and only practical and economic solution of our heating problems. Gas has rightly been termed the "fuel of the future."

Progressive Salesmanship Essential.

The human element in selling is of paramount importance. No progressive business can afford mediocre salesmen. In the last few years the professional standing and qualifications of gas salesmen have been greatly improved. This is largely the result of the Association's course of education for salesmanship. Our course was probably the first of its kind to be sponsored by a national industry. It was built up from the results of a scientific survey into gas sales methods carried out by a group of recognized marketing experts. As a consequence, we have a sales force which has been trained to sell gas service in the most efficient

way, and which is genuinely enthusiastic. Our district Salesmen's Circles at which marketing problems common to the Industry are freely discussed by salesmen from all the gas undertakings in the district, are a good example of the willing co-operation that exists throughout the Industry between all its employees.

In the past a gas showroom was a place where customers paid bills and voiced complaints. Now our showrooms are recognized as places where customers can come with confidence for expert advice on household problems. Consumers to-day realize that it is not in our interest to sell them an appliance unless it will be used to their full and lasting satisfaction. Our real interest is to see that every consumer knows how to get the very best out of her gas equipment with the least possible trouble and expense. A satisfied user of one gas appliance is a "prospect" for other appliances too. That is the reason for the Gas Industry's growing system of "Home Service" and the expert demonstrations of cooking, washing, and so on which we arrange. In many cases the gas undertaking employs women qualified in domestic science for whole time service to the consumers. They visit consumers in their homes, and are always available to advise on equipment and house planning. In the past year the Gas Industry has engaged many such women, and they influence the outlook of the whole of the Industry by giving it a sympathetic insight into the problems of women consumers.

Press Advertising Helpful.

Personal contact of this sort counts for a great deal, but in these days it must be supplemented by advertising. I hope I shall not be accused of undue complacency if I quote from a recent number of the *Economist:*

> "The Gas Industry has nothing to learn, and much to teach in the art of sales publicity."

It is certainly true that the Gas Industry was a pioneer in modern methods of publicity. We were the first industry in this country to start co-operative advertising on a national scale, through the British Commercial Gas Association. Since we began to advertise in the newspapers our sales of gas have increased by 50%; and this development has enabled us to give consistently better service to our customers at lower cost. To-day, with a larger appropriation than ever before, Press advertising remains the backbone of our publicity campaigns. But we are not neglecting other means of reaching the public. The Association supplies its members with a stream of publicity material in the form of leaflets, booklets, and posters, and provides a growing advertising service for local advertisements.

In addition, the first series of national films prepared for the Gas Industry will be shown at this Conference. In the next few months they will be seen by hundreds of thousands of consumers—a graphic reminder of the scope and national importance of the Industry.

Gas in Industry.

Few of the public as yet realize the high scale on which gas is being used by other industries.

We are used to thinking of gas as a universal domestic servant; but it is now becoming a skilled mechanic as well.

More than one-tenth of the total gas output in this country is sold to industrial users. In the case of Sheffield, the proportion of industrial sales is 60%, and in Birmingham 30%. In the Manchester district a single Undertaking has increased its industrial load by 77% in three years, while Edinburgh, not an industrial centre, supplied 18% of the total output last year for industrial and commercial purposes.

The main reason for this development is simple. Modern production methods demand a high grade quality of fuel which can be accurately controlled to give uniform results.

To meet the industrial need for gas it is necessary for us to supply, fix, and maintain a great proportion of the gas-burning appliances which are used in manufacturing processes. Such work cannot be done on a small scale, it demands an expert technical staff and continuous research to deal with the innumerable heat-problems of industrialists.

Gas the Fuel of the Future.

We have therefore made our plans on a national scale. Industrial Gas Development Centres have been set up throughout the country, most of them attached to existing gas undertakings. Neighbouring gas undertakings subscribe to these centres and avail themselves of the technical service they provide. The centres will advise manufacturers on the choice of plant, design new plant, and, if necessary, build it. A co-ordinating bureau keeps the centres in touch with each other's work. In this way the accumulated industrial experience of the Gas Industry is placed at the service of the individual manufacturer.

It is significant that the use of gas is expanding rapidly in the new industries. It is used, for instance, in making wireless sets, gramophones, telephones, aeroplanes, and automobiles, as well as for many processes in the heavy industries.

One of the strongest rivals to gas for industrial purposes is imported oil. Whenever a gas installation is chosen it means that British miners will be kept at work. For gas is nothing but coal on tap—coal made flexible, clean, and easy to control.

The importance of the Gas Industry in our national economy is still imperfectly realized. Indeed, the very term "Gas Industry" is misleading, because it leaves out of account the other vitally important products which are obtained when coal is processed at the gas-works. Coal is still the basis of our national resources of heat and power; and as I have already said the country's economic future depends in great measure on how we treat our coal. Now of all the methods of treating coal, carbonization in the gas-works is admitted to have the highest thermal efficiency and the greatest yield of valuable products.

Solid Smokeless Fuel.

The Gas Industry has been unkindly and unjustly criticized for viewing low-temperature carbonization in the same spirit as a vegetarian would judge a meat diet. Nothing could be further from the truth. It is not a question of meat or no meat, but simply how the meat should be cooked. We in the Gas Industry may be said to prefer it grilled, and the others may be said to prefer it stewed. All we are concerned to find out is which is the cheaper and more efficient method, and we are only too willing to adopt that method, whichever it may be. The Industry has always striven for smokeless skies, for a clean atmosphere, and for the minimization of labour and dust in the necessary provision of heat and other forms of energy to the community. It has had one hundred and twenty years' experience in the heat treatment of coal, during which long period it has explored all the avenues of low and high-temperature carbonization under the guiding principle of commercial success.

The Industry has closely watched every development in low-temperature carbonization and scientific treatment of coal. It has tried out many processes on a large scale at a financial loss, and while the production of a suitable smokeless fuel, and of oils, from our home coal is technically quite possible, the cost thereof is usually prohibitive. Much research work is being actively pursued within the Industry, and what is impossible to-day may be the system of the future; the Industry realizes the importance of home-produced oil.

Oil—the Product of Carbonization.

It is well to bear in mind, however, that enormous strides are being made in the application of the process of hydrogenation. Coal gas contains nearly 50% of hydrogen. Here we have vast potential sources of hydrogen, easily and cheaply obtainable. This hydrogen reacting with the existing oils produced by high-temperature carbonization may well be the source of our own oil, although at present we have to rely on imported natural oils.

In connection with the production of oil from coal, the Edinburgh Gas Department is at present conducting a series of experiments in conjunction with the Fuel Research Board for the production of motor spirit from coal. The results obtained are on the whole encouraging, and when published I have no doubt will prove conclusively that under certain conditions motor spirit can be produced by high-temperature carbonization methods of a quality equal to if not better than that so far obtainable by low-temperature carbonization.

In the provision of solid fuel for the open grate, research has shown that a high volatile content is unnecessary to meet the conditions at present satisfied by raw coal. The reactivity, physical structure, and combustibility of coke fuels produced by high-temperature carbonization of coals prepared by cleaning, sizing, and blending before carbonization can be equal, if not superior, to either coal or low-temperature cokes.

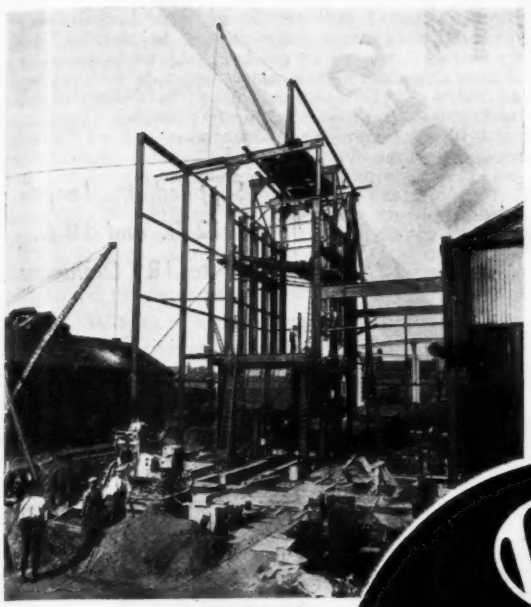
The Commissioner for the Special Areas in England and Wales, in his summarized report, makes the following statement:

> "The main industry in all the areas is coal, but the prospects of increased sale of raw coal either at home or abroad are poor. Hope lies only in the increased application of inventive genius to the extraction from coal of its latent products by scientific treatment."

Gas—A Chemical Industry.

To-day the Gas Industry is already extracting the valuable elements from 17 million tons of British coal every year. The chief by-product—10 million tons of coke—is known to everyone. But not everyone knows how the other

IN COURSE OF CONSTRUCTION



Construction in progress on an installation of W-D Continuous Verticals for Loughborough Gas Dept.

W-D Carbonising Plants at present in course of construction will, when put into operation, be capable of carbonising a total of over —

2,700,000
TONS OF COAL PER ANNUM

W-D

Carbonising Plants

W-D Continuous and Intermittent Verticals
W-D Becker Ovens

An installation of W-D Continuous Verticals put into service recently for the Exmouth Gas Co.

IN SERVICE "THE WORLD OVER"

W-D Carbonising Plants have been built in 24 countries and in works of all sizes. Their total carbonising capacity is now very nearly ——

14,900,000
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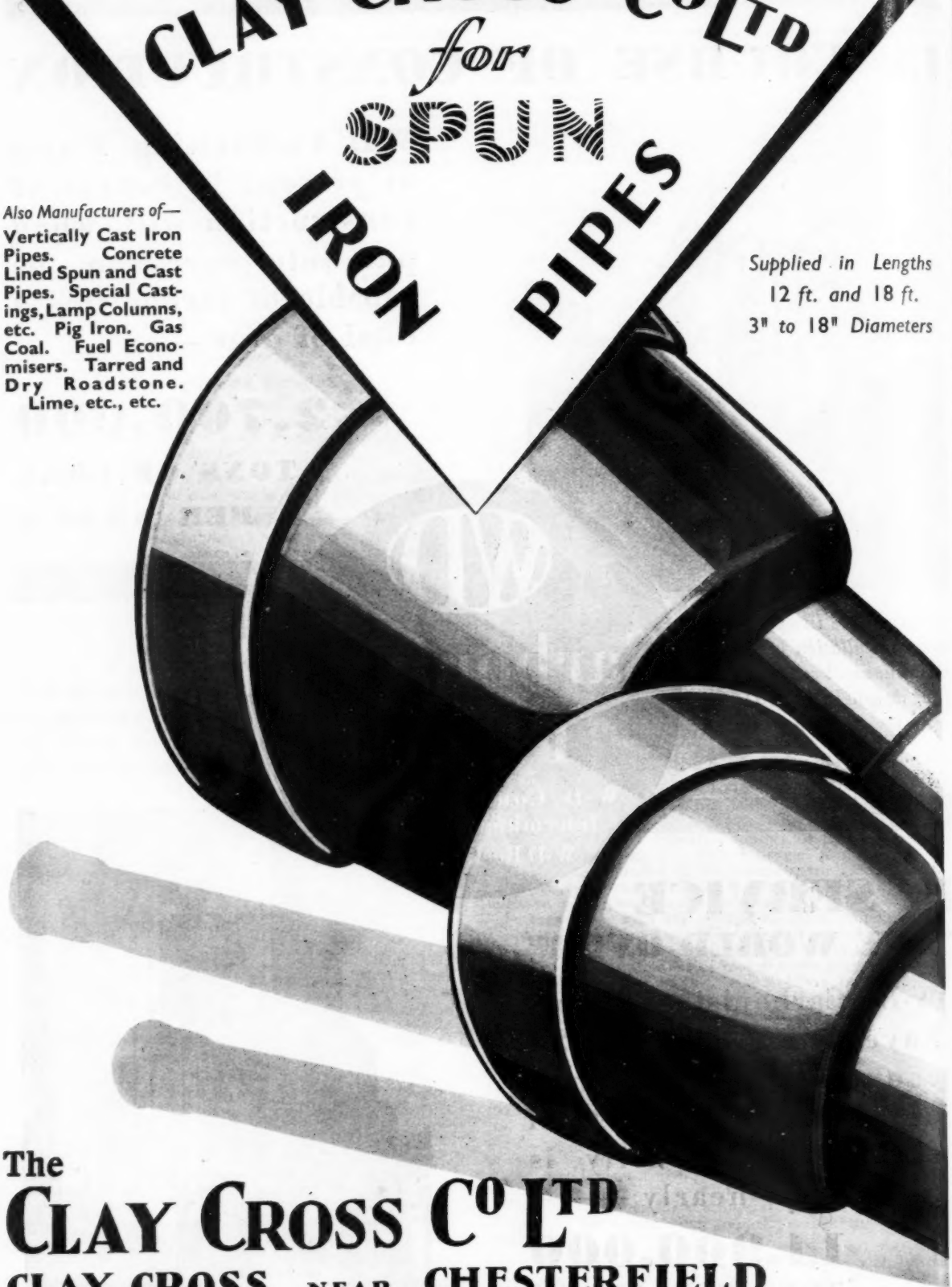

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by-products of gas manufacture are put to the service of other industries. Coal treated at the gas-works yields British motor spirit for cars, and tar for non-skid roads; raw materials for the growing British dyestuffs industry; chemicals for the manufacture of medicines and perfumes. We are even putting coal " back to the land " by extracting fertilizer for farms and gardens.

Even from the narrowest point of view these activities must be of interest to the consumer, because the extraction and sale of these by-products have a direct effect upon the price of gas. It is partly because of these activities that we in this country have the cheapest coal gas in the world.

The internal working of the Gas Industry itself is of special interest at a time when rationalization and large scale industrial replanning are in the air. In this country there are 700 statutory gas undertakings, about half of which are operated by companies, while the other half are municipally owned. A broad national policy has been achieved by the spontaneous adherence of all these gas undertakings to central bodies such as this Association. Yet at the same time the individual enterprise of the members in each centre is preserved. Thus while the Edinburgh Gas Department is in one sense an independent concern owned and controlled by the citizens, in another sense it is a voluntary member of a vast national industry which, by willing co-operation between its members, can exercise a beneficial influence on the life of the whole community.

Workers Co-Partners in Industry.

The relations between employers and employed in the Gas Industry have been for many years of the most cordial kind. Fifty thousand of the workers are actually shareholders (or co-partners) in their own companies, and their stake in the Industry amounts to more than four and a half million pounds. Each one of these men is a shareholder, a consumer, and a gas worker at the same time, and the result is that he has an intense and enthusiastic interest in the welfare of the Industry.

I should like to make reference to the question of municipal control of public utility undertakings, and to stress the need for rescuing these undertakings from changing policies frequently dictated by outside influences.

A public utility under the direct ownership and control of a municipality should be entirely free to develop itself along strict commercial lines consistent with its service to the community. The subsidizing of local rates from the profits of publicly owned concerns is to be deplored, and however specious the arguments in its favour may be, I consider it to be a vicious principle.

In short, municipally owned public utilities should be entirely freed from the slightest vestige of party or political influence, so that they may be immediately responsive to the needs of the consumer and the changing habits and customs of our social life.

There is abundant room for further enterprise on the part of numerous municipalities. A municipality which controls the local gas supply is failing in its duty if it does not seize every opportunity of increasing its activity. This can only be done by intensive and untrammelled work. In addition, municipalities must take advantage of existing legislation to extend and conserve their areas of supply, for the ultimate good of the Industry and the community as a whole. Certain municipalities might well draw a lesson from the remarkable commercial activity now displayed by that great department of State, the Post Office.

I have endeavoured within the compass of this Presidential Address to relate the question of planning in our Industry to the national economy. We are making a valuable contribution to ordered economic progress, and I view the future with confidence and hope. Let each one of us address himself to the pressing problems before the Industry animated by the qualities of courage and enterprise that have characterized our predecessors throughout the years. We are inheritors of a great tradition; we are also the trustees of to-day and to-morrow.

THE WILLIAM YOUNG MEMORIAL LECTURE

Half a Century of Combustion Research

by
Prof. W. A. BONE, F.R.S.

An Abstract of the William Young Memorial Lecture delivered to the North British Association of Gas Engineers at their Annual General Meeting at St. Andrews on Sept. 12.

In the William Young Memorial Lecture entitled " Half a Century of Combustion Research " and delivered at the meeting of the North British Association of Gas Managers in St. Andrews, Prof. William A. Bone, F.R.S., reviewed the changes which had taken place in the theory of combustion since 1880. Chemical theory at that time was beginning to be influenced by the kinetic theory of gases as enunciated by Clausius and Clerk Maxwell, and the revival of the doctrine of mass action by the work of Guldberg and Waage had produced new angles for attack on the problems of combustion and explosion. In fact combustion research was entering on a new era which was ushered in by two momentous discoveries, one by Berthelot and Vieille and the other by H. B. Dixon. The first discovery showed that flame in gaseous explosions is propagated from layer to layer of the medium by adiabatic compression as a wave at a very high uniform velocity.

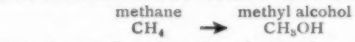
The work of H. B. Dixon was pursued by his collaborator H. B. Baker, who demonstrated the fact that perfectly dry sulphur and phosphorus did not combine with perfectly dry oxygen. This experiment introduced the theory that water was necessary for combustion and this theory has only very recently been shown to be fallacious. The work of Dixon attracted Bone, who has since devoted his life to combustion research. One of the theories in which he has played a great part in enunciating in its modern form is the theory of detonation. At one time it was postulated that the explosion wave was perfectly homogeneous as regards temperature, pressure, and chemical action and that for a given medium under stated physical conditions its forward velocity was constant and independent of tube diameter.

Prof. Bone, simultaneously with other workers in the same field, showed that when a flame is propagated through an explosive medium the wave front is not homogeneous but exhibits a highly luminous comet-like " head " of detonation, rotating with a frequency of several thousandths of a second. This " head " of detonation apparently passes down the tube in a spiral track close to the walls. This discovery was made by photographing explosion flames and has resulted in the enunciation of a new theory of detonation. This is no longer considered as a homogeneous shock wave in which an abrupt change of pressure in the vicinity of the wave front is maintained by the adiabatic compression of the explosive medium. Nowadays it is considered that when a flame is propagated in an explosive gaseous medium there is a flame front and immediately ahead of it there is an invisible shock wave. Under certain conditions, the radiation from the flame front so excites the particles in the shock wave that intense chemical combination takes place and a " head " of detonation is formed, this being the seat of intense combustion. This " head " of detonation starts to spin in a spiral though the medium as a whole does not rotate.

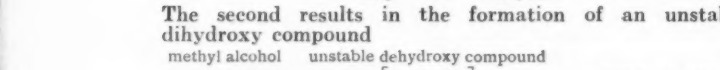
Hydrocarbon Combustion.

Another branch of research dealt with by Prof. Bone was the combustion of hydrocarbons. In the 'nineties of last century a controversy raged as to exactly how hydrocarbons burned, one school of thought favouring the view that at high temperatures hydrocarbons decomposed and the hydrogen burned first and then the carbon. Others contended that the reverse was the case and seemed to be vindicated by the experiments of Dixon on the explosion of an equimolecular mixture of ethylene and oxygen. This

gave carbon monoxide and hydrogen. Prof. Bone, however, felt that it was incorrect to say that all the hydrogen or all the carbon burned first and considered that the explanation might be found in the formation of transient intermediate compounds. This started his experiments on the slow combustion of gaseous hydrocarbons about which next to nothing was known but which since has yielded a rich harvest. The work has shown that a series of intermediate compounds is formed in the combustion of hydrocarbons and the process can be explained by successive stages of hydroxylation. Thus the first stage in the combustion of methane is the formation of methyl alcohol.



The second results in the formation of an unstable dihydroxy compound



which decomposes to formaldehyde and water. The formaldehyde is either oxidized to formic acid which ultimately gives carbon dioxide and water, or is decomposed to water and carbon monoxide which will be oxidized to carbon dioxide.

Hydrocarbon combustion, whether slow or explosive, may thus be regarded as involving successive hydroxylations accompanied by thermal decompositions according as the hydroxylated molecules are stable or not under the conditions of temperature and pressure concerned. There is certainly no preferential burning of either carbon or hydrogen. The higher the temperature the lesser the stability of the primary hydroxylation products, and therefore the sooner and more extensively will their thermal decomposition set in. On the other hand, pressure promotes their stabilities and therefore inhibits their thermal decompositions. It has been objected, within recent years, that while the hydroxylation theory accounts for the main course of the oxidation something of the nature of a " peroxide " must be formed in the initial stage and it has been suggested that knock is connected with this.

Prof. Bone, however, has been unable to find anything of the nature of a " peroxide " among the oxidation products he has obtained from the slow combustion of hydrocarbons and he says that many new points will have to be brought into the reckoning before our theory of hydrocarbon combustion is complete in all its aspects. One arresting result of these researches has been the proof which they have afforded of the vastly superior affinity of hydrocarbons, as compared with either hydrogen or carbon monoxide, for oxygen in explosions. When, for example, a mixture of methane is exploded with three times its own volume of electrolytic gas (oxygen and hydrogen in the proportion in which they are combined in water) under pressure in a closed vessel about 95% of the oxygen reacts with the methane while only about 5% reacts with the hydrogen.

Surface Combustion.

The failure of several Continental chemists to determine experimentally the ignition temperature of explosive mixtures of various gases with oxygen was found to be due to pre-flame combustion at the surfaces of the containing vessels. This prompted Prof. Bone and his collaborators to study the effect of different surfaces on the combustion of hydrogen and carbon monoxide. This study was conducted at temperatures below the ignition points and the following facts were established:

(1) The power of accelerating gaseous combustion is possessed by all surfaces at temperatures below the ignition point in varying degrees dependent on their chemical character and physical properties.
(2) Such accelerated surface combustion is dependent on a prior adsorption of the combustible gas, and probably also of the oxygen, by the surface. The combustible gas thus becomes " activated."
(3) The rate at which the so " activated " combustible gas is burned is relatively very great compared with the rate at which it is rendered active, so that the controlling factor in the process is not the actual rate of combustion at the surface but the rate of " activation " of the combustible gas, which is proportional to its pressure.
(4) The surface itself becomes electrically charged during the process.

These theories were applied to the construction of boilers. In conjunction with the late C. D. McCourt, Prof. Bone realized processes of incandescent surface combustion whereby a homogeneous mixture of gas and air in proper proportions for complete combustion was caused to burn without flame in contact with a granular incandescent solid causing a large proportion of the potential energy of the gas to be transformed into radiation eminently suitable for industrial heating. Two large gas-fired surface combustion boilers, 4 ft. only in length, each with a tubular feed water heater 2 ft. long, were continuously run on coke oven gas for six years at Skinningrove Iron Works, each evaporating at 100 lb. pressure nearly 5,000 lb. of water per hour with a thermal efficiency of 92·7% of the net calorific value of the gas.

Recent work on slow and pre-flame combustion has shown that incomplete combustion is characterized by a rapid accumulation of intermediate products and these may have much to do with the troublesome knock in petrol-air engines.

Dixon and his collaborators were the first successfully to devise an experimental technique for the determination of ignition temperatures, and they explored the " time " lag which had been observed in the case of methane-air mixtures. Their work also indicated the effect of impurities on ignition temperatures of methane-air mixtures—lowered by small amounts of oxides of nitrogen and raised by iodine vapour. This work has proved of importance in relation to the prevention of colliery explosions.

Recent work in this field has shown that with paraffin hydrocarbon air mixtures (except methane) there are two distinct ranges of ignition temperatures separated by a region in which no inflammation occurs. At low pressures the ignition temperatures of all the inflammable mixtures fall in the upper region (500° to 600° C.) but at high pressures they all fall in the lower region (below 350° C.), the change from the upper to the lower being abrupt at some sharply defined pressure. The first systematic researches on electrical ignition were carried out by Prof. Thornton, of Newcastle, who showed that for given sparking conditions a certain minimum " ignition current " is required to ignite a given explosive mixture under given conditions, a matter of great importance nowadays in regard to the safety of coal mines. It is now abundantly clear that the ignition of a gaseous explosive mixture, so far from being so simple a matter as was formerly supposed, involves many different factors. So much so that it is scarcely possible to give any rigid definition of its " ignition temperature," which indeed is no physical constant. It is, however, possible to determine experimentally the lowest temperature at which a given mixture will ignite in given circumstances; and in every case the time factor (" lag ") is of great importance. Indeed, for " safety " purposes the ignition temperature of any inflammable medium should be considered as the lowest to which it need be raised in order for inflammation to result after an infinite time.

In the final portions of his lecture Prof. Bone discussed results which had been obtained from a study of hydrocarbon-oxygen explosions where the explosion mixture was initially at a high pressure. Such explosions using carbon monoxide-air mixtures have shown that the nitrogen becomes " activated " and in being activated it absorbs radiation. This absorption of energy has the effect of slowing down the combustion of the carbon monoxide and produces an exothermic effect during the cooling period due to the " activated " nitrogen giving up its absorbed energy as heat.

In conclusion, Prof. Bone outlined the theory of chain reactions current in chemical circles and pointed out that some of this work still lacked adequate experimental foundation.

Epilogue.

The following is the epilogue to the Lecture:

During the 275 years since Robert Boyle, Robert Hooke, and John Mayow inaugurated the scientific study of combustion, it is remarkable how large a proportion of the fundamental discoveries about it have been made by British chemists. The outstanding names of Joseph Black, Joseph Priestley, Henry Cavendish, John Dalton, Humphry Davy, Michael Faraday, William Henry, Edward Frankland, H. B. Dixon, and H. B. Baker, not to mention those of workers still living, form an almost unbroken succession throughout the past two centuries unparalleled in any other country. And when it is recalled that the Gas Industry arose in Britain through the labours of William Murdoch, and that since 1880 British inventors have led the world in applying the principle of Bunsen's atmospheric burner to innumerable uses in domestic and industrial heating, it is manifest how great a debt humanity owes to British science and invention, so happily and fruitfully blended during the period now reviewed. May they continue to go hand in hand for the benefit of the great industry which your Association represents. I have endeavoured to outline the chief scientific advances during the past half century; may I venture to express the hope that some future " William Young " lecturer will be prevailed upon to complete the story by reviewing how they have been paralleled by equally important technical applications.

WALES AND MONMOUTHSHIRE ASSOCIATION

A LECTURE ON
Refractory Materials

by
A. T. GREEN

An abstract of the Lecture given before the Wales and Monmouthshire Association of Gas Engineers and Managers at their Autumn General Meeting at Porthcawl on Sept. 19, which was referred to in the "JOURNAL" last week.

In his introductory remarks Mr. Green expressed his great belief in the future of the Gas Industry, but emphasized the fact that its progress is dependent upon the continued support and application of scientific research. The Gas Industry has consistently supported research work on refractory materials, mainly because the gas engineers are so dependent upon these products for the continued success of their carbonizing units. In fact, from small beginnings the research work on refractory materials published for the Gas Industry is now a feature of the Autumn Research Meeting of the Institution.

Mr. Green went on to indicate how simple tests can help the Gas Engineer in selecting satisfactory materials for the different positions in retort settings. He emphasized the value of a discrimination of texture as a preliminary guiding feature of a product. He showed how certain unfortunate aspects of failure can be explained on the basis of inadequate texture. The after-expansion or contraction test is one which should be completed on practically all types of materials used in a setting.

The theory of the after-expansion or contraction test for silica bricks and for firebricks can be explained in the following manner: The changes which occur during the firing of refractory materials belong to a class known as "arrested reactions." In these the chemical and physical changes are arrested at particular and definite stages before they are completed. When firebricks are burned the fluxes tend to melt and to dissolve the less fusible substances, binding the whole more or less firmly together. A certain amount of contraction occurs during the operation and if not completed during the firing of the brick it will subsequently continue when the brick is in use. This is called after-contraction. If this after-contraction is considerable, the masonry of the furnace will most certainly be displaced when in operation.

Straight silica bricks usually show an after-expansion consequent on the more or less gradual change of the quartzitic silica with a specific gravity of 2·65 to one or both of the two other varieties—cristobalite and tridymite—with specific gravities of 2·32 and 2·28. It is essential that silica bricks to be used in the construction of gas retorts shall have low values for the after-expansion and for the true specific gravity, otherwise serious strains in the structure will be set up during the working of the retort.

Advantages of Volume Constancy.

In the case of semi-silica or highly siliceous clay-bonded products, the tendency is to obtain a product which does not show either after-expansion or contraction. This volume constancy is an advantage, giving such products definite fields of application. There cannot be the slightest doubt that the application of the after-contraction or expansion test has been of the greatest value to the Gas Industry. It has obviously resulted in an improvement in the texture of firebricks and silica products and an increase in the maximum temperature of the firing operation. It has helped to pave the way to a fuller appreciation of the constitution of silica products.

All associated with the use of refractory materials are conversant with the refractoriness test and its implications. The test has received consideration by the Gas Industry in the past, and found an important place in their Specifications. The test, however, gives no indication of the conjoint influences of pressure and temperature. Such a combination of effects is included in the refractoriness-under-load test.

Important guiding data, which have proved fundamental to our conception of the structural stability of high-temperature installations, have been obtained. For instance, the independent effects of load, temperature, and time on the deformation of typical fireclay products have been examined. As a result of this work, the viscous flow and plastic flow of firebricks, and, consequently, the conditions giving rise to appreciable contraction at high temperatures, have received some definition. Thus, the need for the limitation of the temperature of usage of different products became evident. The refractoriness-under-load behaviour of a silica product has been shown to be very different from that of a firebrick. Usually the superior silica product does not show appreciable signs of deformation in the normal under-load test, even under a load of 50 lb. per sq.in., until a temperature of 1,660° or over has been reached.

Interpretation of Tests.

Research has indicated that it is desirable to carry out, at least, two tests on the same material, one with a high loading, say, 50 lb. per sq.in., and the other with a low loading of 10 or 4 lb. per sq.in., obtaining the progressive change in the linear dimensions of the specimen during each test. In order to interpret the tests adequately it is necessary to consider (*a*) the temperature at which subsidence becomes apparent; (*b*) the temperature at which a marked acceleration in the rate of subsidence occurs; (*c*) the subsidence ranges; (*d*) the effect of load on the temperature extent of the subsidence range; and (*e*) the appearance of the pieces after testing.

There can be no doubt that the application of this test has resulted in considerable improvements in the texture of the commoner refractories, and this has reacted very favourably on their durability in practice. However, it should be emphasized that there are many aspects of the mechanical properties of refractory materials at high temperatures which have, up to the present, received little or no attention. In fact, a considerable field requires exploration. In the main, stability at high temperatures has been investigated from the viewpoint of one test; its broader and more fundamental significance calls for considerable study.

In a further discussion on the factors influencing texture, Mr. Green showed how the measurement of permeability can be used in a simple manner to help the user of a refractory material. He also indicated that the nature of the pore system, while having little effect upon the gas leakage in retorts, is, nevertheless, of considerable importance in a study of the deleterious effects of gases and vapours on the durability of refractory materials. He laid particular stress on the effects of alkali vapours which were known to have a determining influence on the durability of firebricks. This brought the lecturer to a consideration of the effects of carbon monoxide and hydrocarbon gases on firebricks. He showed that under certain conditions of temperature such gases can be decomposed by certain types of "iron" inclusion in a firebrick, and carbon deposited within the body of a firebrick. Such deposition very often causes the complete disintegration of a product. He described simple tests indicating these effects.

Zonal Effects in Vertical Retorts.

Zonal effects in vertical retorts were then dealt with. It was shown that the same type of trouble appears to

take place at similar positions in vertical retorts. Such troubles include flaking in the upper portion of the retort, and erosion and slag attack in the lower portion. During the scurfing operation, surface disintegration, generally at positions in the upper half of vertical retorts, often takes place, pieces of the refractory coming off with the scurf. There can be little doubt that where scurf is burned off by the admission of air, localized high temperatures owing to the rapid combustion of the carbonaceous matter may result, following which there may be a fairly rapid cooling effect. The surface in contact with the scurf has probably been weakened at definite planes by (*a*) depositions and impregnations; (*b*) constitutional changes in the silica in the surface layers resulting from previous high temperature scurfings; and (*c*) a general spalling tendency of silica products.

Thus, it seems that the influence of such periodic high temperatures, besides embrittling the surface, may easily disintegrate an already-weakened material. The surface of the retort at the flaking zone is not equally affected. Those portions of the retorts adjoining tiles, or which are otherwise supported, do not show the trouble to the same degree as those which bound the combustion chamber. Again, certain retorts in the setting, by reason of their position, receive a lower and less variable flue temperature. These do not show the trouble to the same extent. These observations point to the fact that the combustion chamber temperature and its possible variability, although not necessarily the direct cause, have an influence on flaking.

The properties of the scurf itself have receiyed little attention. There can be little doubt that the extent of the adhesion of this substance to the refractory, together with the amount of its thermal expansion or contraction during the operation of the retort, particularly scurfing, play some part in the disintegration of the refractory surface. Experience with different retorts carbonizing different coals suggests very strongly that the nature of the scurf varies considerably with the coal used and the carbonizing conditions chiefly including temperature. For instance, the tenacity with which the scurf is held to the surface varies very much in different settings. It is also possible that the thermal volume changes of the scurf also vary with its nature. It would seem, then, that the phenomena associated with the formation and rate of growth of scurf require careful definition. Finally, it is probable that some variation in the method of scurfing may reduce the flaking of retorts.

In conclusion the lecturer gave indications of the type of programme of research work followed by the British Refractories Research Association. He emphasized the co-operative nature of this work. It is only by the policy of co-operation between manufacturer and user that the greatest benefits can be obtained. He gave examples of how this system can be progressively applied.

Discussion.

Mr. G. T. Clark (Manchester) congratulated the Association upon having persuaded Mr. Green to come and give them a lecture, for he knew his subject from beginning to end. He noticed that the lecturer had told them the cause of things, but not the cure. Mr. Green and himself had been associated on many occasions on questions of spalling, and so forth. Spalling was a terrible disease, but what was the cure? When Mr. Green gave them his next lecture, would he tell them this?

External Expansion Spaces.

Mr. W. M. Fox (London) suggested that research should not be confined only to the manufacture of bricks, but should be extended to the actual methods of construction and brick-laying—and particularly with regard to expansion spaces allowed in silica work. It would be agreed that the manufacture of bricks could not be brought to such a stage of perfection that every brick would be of precisely the same length, and expansion spaces could be carried within the small limits which were required. In construction of silica work, therefore, small internal expansion spaces should be avoided, and silica blocks should be built solidly, with external expansion spaces of generous dimensions, which would be filled up when expansion had taken place.

Greater Support Needed.

Mr. W. Clark Jackson (Neath) said that, as one who appreciated the advantages of first-class work, he could assure Mr. Green that he had served a very good purpose by coming along and giving them this address. There was quite a large number of gas undertakings that did not yet contribute to the Refractories Research Association, and having regard to the fact that they were all deriving benefit from the work, and were hoping to derive still further benefit, this was an omission which should be rectified. Every undertaking should contribute its fair share towards work which was of such value to the Industry in general. Those who had vertical plants, especially, knew how much care had to be exercised in the control of the settings, if a reasonably long life was to be assured. They knew, also, that the settings themselves—the actual constructional work of the settings, and the actual bricks—had greatly improved within the last ten years or so, and this was going to be of considerable advantage to them. He did wish, therefore, to emphasize as strongly as he possibly could the fact that they ought to support the Refractories Research Association to a greater extent than they were doing at the present time.

Importance of Refractories Research.

Mr. J. H. Canning (Newport) said he could with complete sincerity propose a hearty vote of thanks to Mr. Green, for he had seldom heard an address which more deserved thanks than the one to which they had just listened. It possessed the distinguishing characteristic of having been given by a master of his subject who could make it perfectly clear to others. Every one of those present had been interested in every word that had been said. One particular matter to which he would like to refer was the importance of this research. He did not think there was any branch of research to which The Institution of Gas Engineers had contributed that had brought about more substantial and concrete results than this research on refractories. Some of the younger generation present that day might not appreciate this, because they had had experience of modern refractories only. But the older members of the audience would remember the time when nothing whatever was known of what Mr. Green had been telling them about that morning. It was then simply a matter of "rule-of-thumb" which the engineers of the time had based upon a certain amount of experience, and when things went wrong they did not know the reason. They were working largely in the dark. If it were possible to estimate the amount of money saved to the Gas Industry through the increased life of refractories and the better results obtained by the use of modern settings, it would reach, over the past ten or twenty years, an enormous sum. He hoped that they might have the pleasure and profit of another address from Mr. Green in the near future.

Pioneer Work.

Mr. W. H. Johns (Swansea) remarked that he was very glad to have the opportunity of seconding this vote of thanks, because it might interest Mr. Green to know that, when this subject of refractories was first brought prominently to the front in the Gas Industry, one of his (the speaker's) old Chiefs, Mr. F. J. Bywater, introduced it to The Institution of Gas Engineers by presenting a Paper on "Refractory Materials"—the first and only one, he believed, presented by a gas engineer. In the preliminary work connected with this Paper, he had the pleasure and honour of assisting Mr. Bywater in the carrying out of tests. Since that time, of course, Dr. Mellor, Mr. Green, and others had gone into the subject in a very thorough manner. In the early days to which he had referred, grog and iron content received careful attention. It had always to be borne in mind that unless a brick was properly set, all the good work done by gentlemen like Mr. Green would be absolutely wasted. The settings must be properly constructed. He himself had seen examples of damage arising owing to the fact that due allowance had not been made for expansion in silica work. It might surprise some of them to know that he had seen a "lift" in the arch of a retort bed, due to improper setting—purposely done for the sake of experiment—which amounted to more than 8 in. Improvement in their settings must result in a substantial saving to the gas undertakings, and no one should grudge paying his share of the expense incurred in the work of investigation.

Two Hundred Papers.

Mr. Green said he was very glad to learn that his lecture had been appreciated. He refused to be dogmatic in his assertions with respect to the absolute causes of failure, but it was possible to find indications which resulted in improvement being brought about. Expansion presented a serious problem, but he could say definitely that, in consequence of greater knowledge of the constitution of silica bricks, &c., they possessed much more precise information as to the extent of expansion. Their trouble was that they could not heat a retort installation evenly throughout. He recalled the formation about a quarter-of-a-century ago of a Committee of The Institution of Gas Engineers, in which Mr. Bywater was the leading spirit, and traced events down to the formation of the Department of Scientific and Industrial Research, and the subsequent coming into being of the British Refractory Research Association. After some ten years, it was felt that the work should be continued, but that the time had arrived when more money should be collected from industry. The Gas Industry came to the rescue again and collected a reasonably good subscription, and that had helped them to get more from the manufacturers. "We have," concluded Mr. Green, "published over 200 Papers on different phases of the subject during the last fourteen or fifteen years. If you do not think it worth while, do not support research; but if you do think it worth while, then support it well."

LONG SERVICE TO THE GAS INDUSTRY

A number of firms of long standing on the contracting and manufacturing side of the Industry have collaborated with the "JOURNAL" in the production of a series of articles, under the above title.

Saml. Cutler & Sons, Ltd.

Over 90 years ago, in 1844, two brothers, George and Samuel Cutler, established a factory in City Road, North London, for the manufacture of gas-works plant, and the management of the Firm has, during all this long period, been conducted by their lineal descendants, the present Chairman and Managing Director, Mr. Saml. Cutler, and the General Manager and Director, Mr. Ernest Cutler, both being grandsons of one of the original founders. The business soon outgrew the capacity of the original factory and was transferred to larger premises at Millwall in 1858, and again transferred 10 years later to the present extensive Thames-side premises, Providence Ironworks, Millwall.

The Firm remained a partnership until 1911, when it was constituted a private limited liability company. In 1922 Mr. Arthur Gardham, the senior of the Technical Staff, was appointed a Director.

The Chief Offices of the Firm are at Westminster and have recently been considerably extended, and a Research Department and Model Room added to deal with new processes and inventions.

Although Messrs. Cutler manufacture a large variety of products, they have always been particularly identified with gasholder construction and have a world-wide record and reputation in this important branch of the Gas Industry. Manufacturing methods have been revolutionized time and time again during their 90 years of activity, but they have always kept well abreast in all improvements both of design and machinery, and can claim to have at Millwall the most modern and efficient plant of every kind for accurate and economical manufacture.

Modern Methods.

In their early days steam was the only motive power; machines were driven from countershafts and the manual work of fabrication was heavy and exhausting. Holes were "punched" with resulting deterioration of the metal, and standards of accuracy were necessarily low compared with those now attained. Cast iron entered largely into constructional work of all kinds, and machined surfaces were the exception rather than the rule. By contrast, the present machinery at Millwall comprises for power purposes gas, electricity, oil, hydraulic, and pneumatic services and machinery for stamping, shaping, and drilling with a minimum of manual labour practically every part of the numerous and diverse structures manufactured. Also the use of cast iron is restricted to purposes for which it is especially suited, and machine surfacing is the rule and not the exception.

Although drilling has, in modern practice, displaced punching wherever the thickness of metal to be perforated is considerable, it is not necessary to drill gauge sheets of the thickness used for gasholder sheeting, as the light pressure required for their perforation is insufficient to cause deterioration of the metal. But to ensure accuracy the holes should be punched in multiples, and the Millwall presses perforate the entire side of a gasholder sheet in one operation.

Gasholders are the largest moving metal structures in the world, and Messrs. Cutler have constructed many of the largest now in use. To convey some idea of the size of these huge constructions, it may be mentioned that the Albert Hall at South Kensington could be comfortably accommodated inside the 8 million cu.ft. gasholders erected by Messrs. Cutler at the Kensal Green Station of the Gas Light and Coke Company and at the Neepsend Works of the Sheffield Gas Company. It is no mean engineering achievement that these giant constructions operate for a 24-hour day, year in and year out, in all weathers for half-a-century almost unattended.

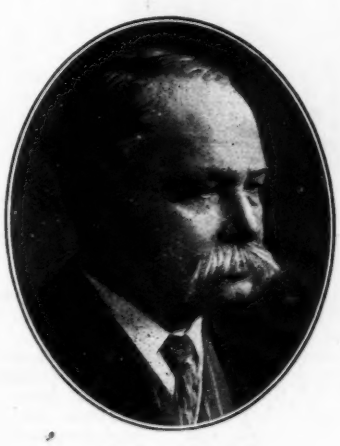
Overseas Contracts.

The location of Messrs. Cutler's Works on the Thames has assisted them in securing many important contracts for gasholders in colonial and foreign lands, and, to instance only a few, these include Amsterdam, Paris, Copenhagen, Berlin, Vienna, Rome, Hanover, Frankfort, Turin, Milan, Genoa, Ceylon, Bombay, Calcutta, Smyrna, Malta, Pernambuco, San Paulo, Townsville, &c. The opportunities for export work of this kind are now unfortunately greatly diminished, but Messrs. Cutler are, at the present time, erecting new gasholders in Hong Kong, Shanghai, and Jamaica.

In the home trade their record secures them a place in the tendering list for practically all gasholder work of every size and kind, and there are few gas-works that do not contain some of their constructions. Recent contracts include large gasholders at Beckton, Hornsey, Watford, North Middlesex, Barnet, Brighton, Worthing, and many reconstructions and repairs.

Although for economic reasons spiral-guided holders have, in recent years, been very generally adopted, there is still much to say in favour of the guide-framed type, and the "Cutler" triangulated guide-frame as illustrated

SAMUEL CUTLER,
Founder of the Firm, 1818–1870.



SAMUEL CUTLER,
Son of the Founder, 1844–1923.

SAMUEL CUTLER,
Grandson of the Founder,
Present Chairman.

2,000,000 Cu.Ft. 880,000 Cu.Ft. 880,000 Cu.Ft.

Three Gasholders Erected at Rome, with Steel Tanks and "Cutler" Guide Frames.

above is claimed to be the most scientifically designed and extensively adopted form of standardized guide-frame ever introduced.

In regard to spiral guiding, Messrs. Cutler have to their credit many improvements relating to the reliability of the guide carriages and safe access to them for periodical examination and lubrication, including their patent "London" lubricator which, by a piston and star wheel device operated by the motion of the rollers, forces grease from a container on to the axles and keeps them self-lubricated without manual attention. This useful device can also be applied to the rollers of guide-framed holders.

Ensuring Gasholder Safety.

A recent development is the institution by Messrs. Cutler of a Model Room adjacent to their Westminster Offices, where models of many of their specialities are on exhibit. There are also shown samples of sheetings and framings cut out from gasholders of various ages for inspection and repair purposes, with the mechanical devices used for their extraction while the holders are still in use. In view of the lively interest shown of late in methods for ensuring the safety of holders, it seems probable that many Engineers will welcome the opportunity of visiting this exhibit and inspecting the samples that have been extracted from old gasholders and subjected to metallurgical and microscopic examination and reliability tests.

Necessity stimulates invention, and brains have been at work to discover some means of ascertaining the metallic thickness of the sheeting of gasholders or other closed vessels without the need of perforating the sheets. An apparatus that accomplishes this has now been devised, and it can be seen and demonstrated at the Model Room. It is known as the "Evershed sheet tester," and is based on magnetic action. The apparatus is small and portable, and does not require any accessories or attachment to the gasholder. It simply has to be placed in contact with the exterior surface of the holder sheet and indicates the thickness of the metal on a graduated dial. It is fitted with a shoulder strap for carrying, and the whole operation is of the simplest kind.

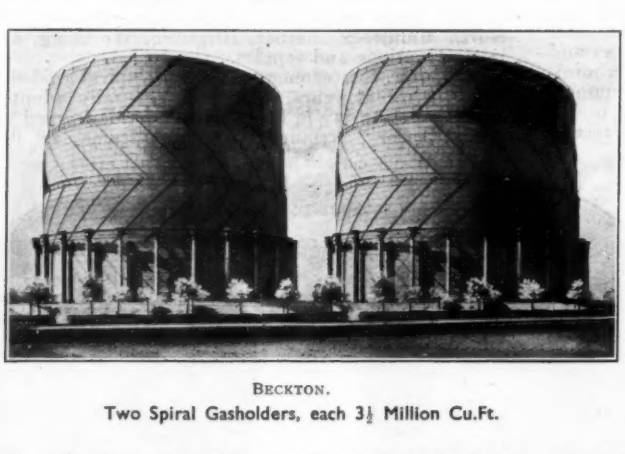
Another novel and interesting exhibit is an Introscope by means of which an examination can be made of the internal seams or other local details of a gasholder. It is constructed on the principle of the periscope, and the sighting tube is passed into the interior of the holder through a small orifice in the sheeting. The interior details are reflected through a series of lenses electrically lighted, and are observable by looking into an exterior eye piece. The sighting tube is fitted with a rubber ball joint to allow it to be moved angularly without escape of gas at the orifice through which it is inserted into the holder.

The application of both these devices to Gas-Works Plant has been developed conjointly by Messrs. S. Cutler & Sons, Ltd., and Messrs. C. & W. Walker, Ltd., and both firms are licensed for their sale and use.

Other Gas-Works Plant.

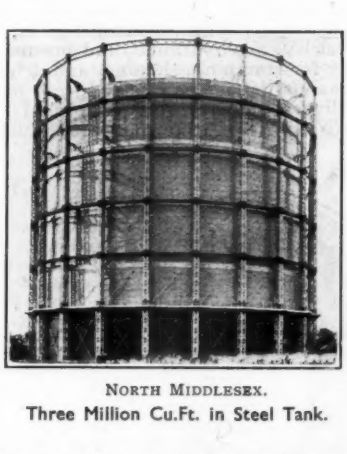
In addition to gasholder building, Messrs. Cutler have a long record in condensing and purifying plant of all kinds. Their first patent for water tube condensers dates back to 1878, and they were the introducers of deep-filled purifiers on the "Jager" system. Back in the eighties they installed at Belfast the "Claus" system of liquid purification, and they have been considerable manufacturers of carburetted water gas plant, their installations being over 70 in number and including plants in Berlin, Rome, and Amsterdam.

In retort work they were co-introducers with the late Mr. Charles Hunt of the "Dessau" intermittent vertical retort system into this country. Conveying plant, storage bunkers, and telphers are an important branch of their business, and large installations of plant of this kind have been constructed by them at many British and foreign gas-works including Brighton, Amsterdam, Genoa, and numerous other places.



BECKTON.

Two Spiral Gasholders, each 3½ Million Cu.Ft.



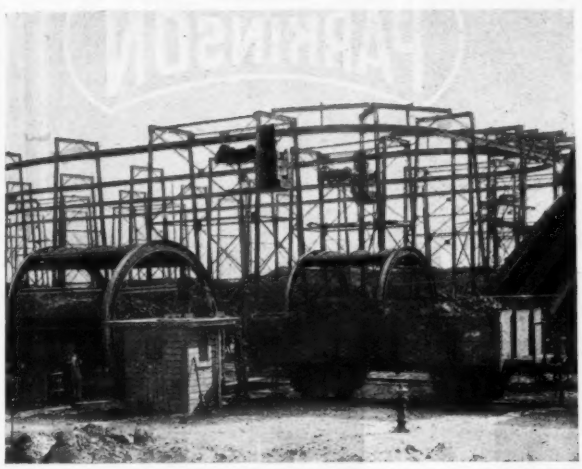
NORTH MIDDLESEX.

Three Million Cu.Ft. in Steel Tank.

Activities in other Industries.

Apart from gas-works plant, Messrs. Cutler have many other manufacturing interests of long standing including refrigeration, oil storage tanks, and every kind of constructional steelwork.

The Eversheds Sheet Thickness Tester.



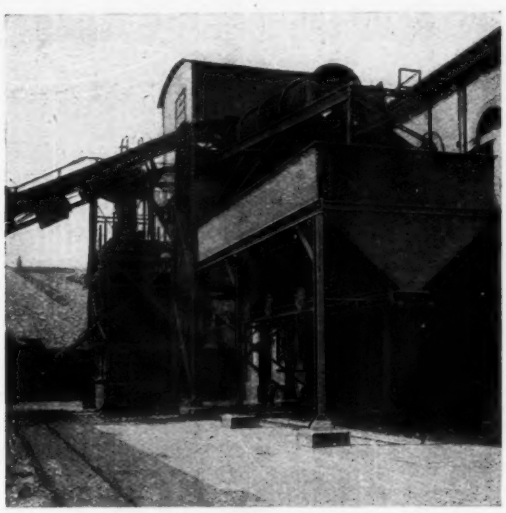
Truck Tipplers, Conveyors, and Telphers at Amsterdam Gas-Works.

As ice tank constructors successively for the Linde British Refrigeration Company and the Lightfoot Refrigeration Company for over 40 years, they have manufactured most of the ice making tanks in use at British fish ports, many of 50 to 100 tons ice capacity, and numerous ice making and brine cooling tanks for export to India and the Colonies.

Steel tanks of every size and type for oil storage have long been a standing speciality.

During the War years 1914-1918, almost their entire manufacturing resources were requisitioned by the Admiralty in the production of submarine mines, depth charge gears, &c., and hydrogen producing plant. Several hundred plants, ranging in capacity from 2,500 to 60,000 cu.ft. of hydrogen per hour, were made at Millwall for airship and kite balloon inflation.

It is interesting to note that Messrs. Saml. Cutler & Sons, Ltd., are the only gasholder makers whose Works are in London. This location might, a few years ago, have been considered rather a handicap, but, having regard to the present trend of industrial movement, their tenacity to the South appears to be fully justified and to place them in a favourable economic position for much future business, especially as, in addition to possessing excellent wharfage on the Thames with 20 ft. depth of tide, they have rail communication into the Millwall Docks and thence on to all trunk railways, also a frontage on the West Ferry Road providing equally good facilities for motor transport.



Coke Screening and Grading Plant at Hornsey Gas-Works.

It is pleasant to learn that many of this old-established Firm's employees are the sons and even the grandsons of their former workmen.

No significance whatever attaches to the order in which articles appear in this series.—ED. "G J."

Sources of Atmospheric Pollution

Dr. Lessing Speaks at Smoke Abatement Conference

In the course of a Paper which he read before the Annual Conference of the National Smoke Abatement Society, held at Bristol on Sept. 20 and 21, Dr. R. Lessing discussed the sources of atmospheric pollution.

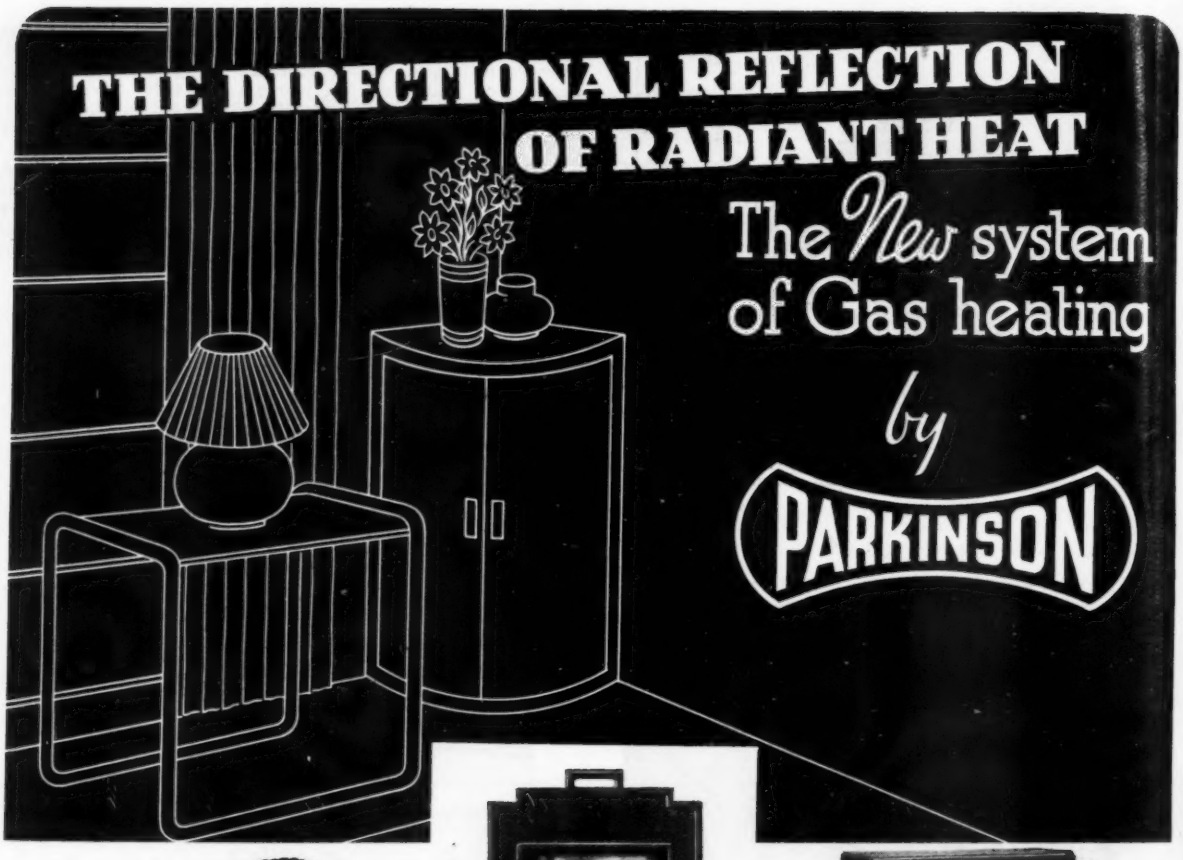
In order to consider the production of smoke, he said, the behaviour of various fuels during combustion must be studied. Combustion is by no means as simple a process as might appear from the final products of the combination of oxygen with carbon and hydrogen. And if the combustion of the simplest type of hydrocarbon, such as methane, presents theoretical difficulties, how much more complicated are the conditions of combustion of the complex hydrocarbons, such as the so-called illuminants in coal gas, or the constituents of ordinary motor spirit?

The production of semi-coke is only small as compared with the total fuel consumption of the country, but it is large enough to form a useful measure of its popularity with those who are in the habit of using this fuel. In years to come it will probably be found that with the goodwill of all parties concerned the Industry can be carried on with a normal moderate trading profit and will fulfil a useful purpose. What matters from the point of view of to-day's discussion is that the fuel produced, provided it is made from low-ash coals and is of reasonable density and sufficient strength to resist breakage during transport and handling, should be welcomed as a smokeless domestic heating agent in addition to, and not necessarily in substitution of, coke, anthracite, gas, and electricity.

Until a few years ago smoke was considered the principal contributor to "atmospheric pollution." It was known and realized that the sulphur contained in all fuels gave rise to the formation of acids which caused severe corrosion in everything with which they came in contact, in particular, building materials, metals, and textiles. The quantitative effect of these impurities has, however, not been realized and is perhaps even to-day not sufficiently appreciated. In 1934, 19,282,000 tons of coal and coke were brought into London, and with minor exceptions, such as gas coke exported, were consumed in London.

The railborne coal may be regarded as mainly domestic and the waterborne as mainly industrial. Assuming the sulphur content of this coal to be 1%, which must be regarded as a minimum, we find that a total of nearly 500,000 tons of sulphur, expressed as sulphuric acid, is discharged into the atmosphere from the 700 square miles of Greater London, industrial uses being responsible for about two-thirds and domestic consumption for one-third of the total. At the lower temperature of the domestic grate a little sulphur is probably retained by the ash which may call for a slight adjustment. An adjustment of this figure must also be made in respect of the sulphur removed in the purification of coal gas, amounting to about 55,000 tons per annum, and in respect of the sulphur contained in gas coke exported from London, which accounts for about 12,500 tons in terms of sulphuric acid.

THE DIRECTIONAL REFLECTION OF RADIANT HEAT

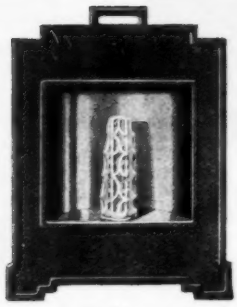


The *New* system of Gas heating by

PARKINSON

The ZONEX *Portable* Gas Fire

Another triumphant development. The "Zonex" consists of a horizontal chromium reflector, above which is placed a unique heating element of patented all-metal construction embodying special alloys. No breakable refractory material is incorporated. The "Zonex" with its wide horizontal distribution will undoubtedly appeal greatly to consumers and further extend the selling field of gas.



The PARAVEX *Portable* Gas Fire

The new system of directional radiation pioneered by Parkinson, was successfully initiated by the "Paravex." This portable gas fire quickly attained immense popularity, and proved to be the most economical and convenient means of providing cosy warmth for any room at will.

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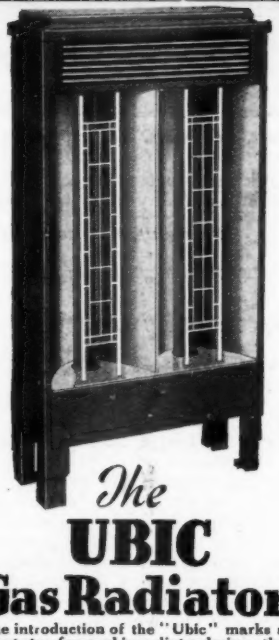

The UBIC Gas Radiator

The introduction of the "Ubic" marks a great step forward in radiator design—the new system of gas heating now provides a radiator which really radiates. The radiant heat is directed where it is wanted—into the room, resulting in more rapid room warming than hitherto obtained by gas radiators.

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MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES

THE BRITISH COMMERCIAL GAS ASSOCIATION

Annual Report of the General Committee

The following is the General Committee's Twenty-Fourth Annual Report and Statement of Accounts to the Members, Associate Members, the Administrators of Gas Undertakings, and the Members of the Society of British Gas Industries subscribing to the Association. The Report covers the work done during the past twelve months; the Accounts cover the year ended March 31 last.

General Review.

The past year has been one of considerable development in the Association's activities, both in the period under review and in respect of the immediate future.

Concurrently with the increased publicity which has been made possible by the larger income from the higher rate of subscription, special attention has been given to improving and increasing the service to members on all aspects of commercial development in the Industry. Detailed information will be found in the various sections of this Report.

British Gas Federation.

The Association, which is one of the five constituent members of the British Gas Federation, has approved its Constitution and appointed five members of the Council. The first Annual General Meeting of the Federation will be held in London on Nov. 4, and will be followed by the Second Annual Dinner.

Women's Gas Council.

Welcome has been widespread of the formation of the Women's Gas Council, which commenced its activities a few months back under the Presidency of the Marchioness of Londonderry.

The Committee feel that the projected work of the Council is worthy of the fullest possible support and assistance of all gas undertakings.

Jubilee of H.M. The King.

In co-operation with the Joint Lighting Committee of the Institution of Gas Engineers, the Association gave assistance to members in many parts of the country in arranging floodlighting installations by gas, which constituted an important and very popular feature of the Jubilee Celebrations.

Editorial Press publicity was secured for the many fine installations which were so arranged, and appreciation of the Industry's co-operation was expressed in Parliament.

Participation in Important National Conferences.

The past year has been marked by a series of important National and International Conferences at which the Gas Industry was represented, and at some of them the Association was privileged to arrange for the presentation of Papers.

Among the more important may be mentioned:

International Housing and Town Planning Congress (London). (Paper by Sir Francis Goodenough, C.B.E., on "Gas in the Working Class Home.")

International Congress for Scientific Management (London). (Luncheon given by the Gas Light and Coke Company to the Women Delegates of the Domestic Section.)

National Smoke Abatement Society Conference (Bristol). (Paper by Mr. G. L. Jennings—Official Lecturer to the B.C.G.A.—on "Gas in Housing.")

Association of Public Lighting Engineers Annual Meeting (London). (Several Papers by representatives of the Gas Industry. Joint luncheon by the Gas and Electrical Industries. Luncheon by the Tottenham and District Gas Company to the Conference Delegates.)

International Commission on Illumination, Germany.

Finance and Administration.

The urgent need expressed in previous Annual Reports for increased financial support to the work of the National Associations has resulted in a gratifying response from the Industry, and it is satisfactory now to be able to record that 615 undertakings agreed to contribute at 10s. per million cu.ft. during the year ended March 31, 1935.

In comparing income and expenditure for the year with the corresponding figures for previous years, members will find considerable satisfaction in the extent to which the Association is now able to carry out National publicity and propaganda, but that degree of satisfaction must not lead to complacency, for it is only satisfaction to a degree. The Industry still has to face competition more keen than ever before in its history, and every effort will have to be continued and developed to maintain public interest in gas. As already stated in this Report, the majority of members have readily given their full support to the Association's work, but there are still undertakings who are not realizing and consequently not bearing their full responsibilities. It is earnestly hoped that in these cases the difficulties standing in the way of paying their full share of co-operative work will speedily be removed.

Headquarters Staff.

No important changes have taken place in the staff of the Association since the last Annual Report. The reorganization which took place in the early part of 1934 has resulted in the Association being able to render increasing services to its members. These services are detailed in the various sections of this report; but the Committee would like to testify to the good and unremitting work which has been done by a keen and loyal staff, and to the fact that everything possible has been, and will be, done to assist member undertakings. Every effort has been and is being made to enable the principal members of the staff to get into personal touch with individual members.

Staff Superannuation Scheme.

The Sub-Committee (under the Chairmanship of Past-President Mr. John E. Daw) set up by the Joint Co-ordinating Committee to consider a contributory scheme under which provision would be made for the reasonable superannuation of members of the staff, prepared a scheme which has been approved and is now in operation.

The scheme has been welcomed and is appreciated by the members of the staff contributing, and the thanks of the Association are due to the Sub-Committee and to Mr. Daw in particular, for the large amount of time and trouble which they gave to bringing the scheme into being.

Office Mechanization.

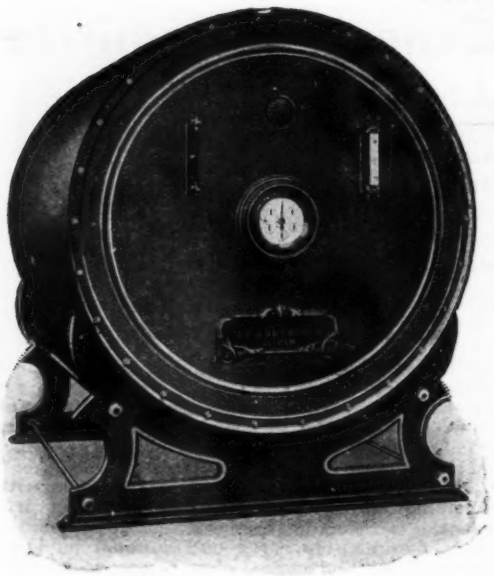
The work at Headquarters has developed to such an extent that the mechanizing of the work of several members of the staff became necessary if a material increase in staff personnel were to be avoided. The installation of several office machines has proved very successful and has resulted in a considerable saving of time and money.

National Publicity.

The main advertising campaign of the year lasted from September to March. To quote the comment of an advertising journal, the keynote of that campaign was "a series of questions likely to be asked by the harassed housewife. Mr. Therm gives the answers, making fresh friends for life." The layout and design of the advertisements met with praise by expert (external) judges—*e.g.*,

Braddock's Gas Station Meters

Positive Measurement.



No. 245.—BRADDOCK'S 1500 LTS WET METER.

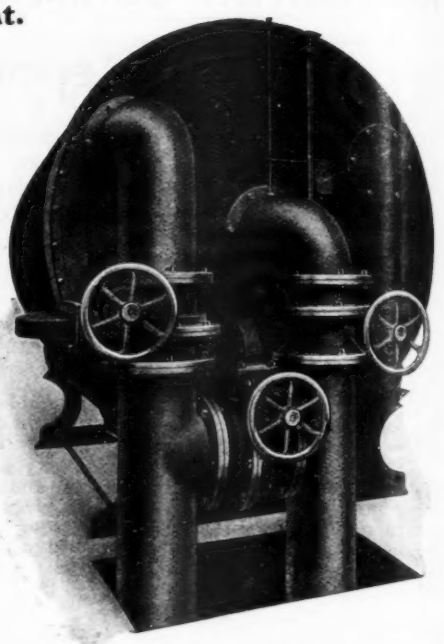
In Cylindrical Cases, for from 500 to 30,000 cubic ft. per hour.

The Best in the Market.

Dimensions and Full Particulars upon application.

OF SUPERIOR QUALITY AND CONSTRUCTION.

May be seen working up to full capacity before delivery.



No. 10a.—BACK VIEW OF ROUND METER WITH SLIDE VALVES AND BY-PASS.

J. & J. BRADDOCK, (BRANCH OF METERS LIMITED). GLOBE METER WORKS, **OLDHAM**

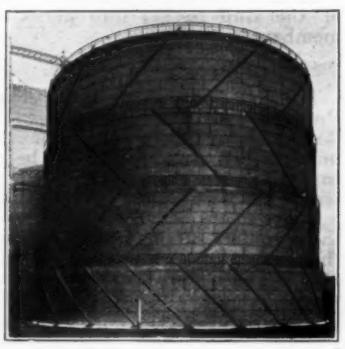
Telegrams: "BRADDOCK OLDHAM." Telephone No.: MAIN (OLDHAM) 3815/6

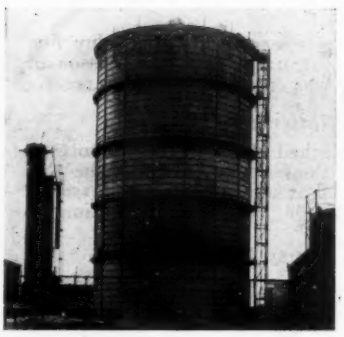
AND 45 & 47, Westminster Bridge Road, LONDON, S.E.

Telegrams "METRIQUE LAMB LONDON." Telephone: No. 2412 HOP.

SAML. **CUTLER** & SONS LTD.

GASHOLDERS
GUIDE FRAMED
SPIRAL
WATERLESS
(KLONNE)
STEEL TANKS





PURIFIERS
CONDENSERS
COAL AND COKE
HANDLING PLANT
SCRUBBERS AND
WASHERS

39, VICTORIA STREET
WESTMINSTER
LONDON, S.W.1

Telegrams: "RETORTUS SOWEST, LONDON"

Telephone: VICTORIA 8492, 0321

CONTRACTORS FOR ALL KINDS OF GASWORKS PLANT AND APPARATUS

PROVIDENCE
IRONWORKS
Millwall, LONDON, E.14

Telegrams: "CUTLER MILLWALL, LONDON"

Telephone: - - EAST 1734-1735

"It appears that a new star is rising in the commercial art firmament. Natural figures, as in the gas advertisements, are a refreshing change from the doll-like mannequins dressed in clothes that would cost the average British family a year's income." (Advertising Supplement to "Marketing.")

The campaign was linked with a photogravure booklet of which more than 500,000 copies were distributed. It was used also to introduce a National Kitchen-Planning Competition, which aimed at bringing consumers into the Industry's Showrooms. A large number of members supported the campaign with special advertisements in their local Press and with displays supplied by the Association's studio. In many cases the national prizes given by the Association were supplemented by special prizes offered by the members. The competition produced some 23,000 entries and undoubtedly did good work in teaching competitors the advantages of gas appliances and their proper arrangement in the kitchen.

The Press took a considerable interest in this competition, and editorial paragraphs referring to it reached a total of more than 450, thus keeping public interest alive long after the campaign was finished.

The second campaign of the year pressed the advantages of gas for water heating over a ten-weeks period. It was supported by a special issue of "A Thousand-and-One Uses for Gas," illustrating every type of gas water heater. The volume of sales enabled the Association to quote a very low price for the booklet.

Press Contact.

The Association's Press Bureau has during the year supplied material and illustrations for close on 1,500 articles which have appeared in significant newspapers and magazines. These included national dailies with an aggregate circulation of several millions; influential district newspapers; good-class women's magazines; and books by well-known authors dealing with domestic matters. Some 600 photographs and 70 blocks have been lent to editors to illustrate domestic and technical articles, each illustration being specially selected.

Several members have co-operated by arranging with their local newspapers to insert articles on gas at fortnightly or monthly intervals. These articles are supplied by the Association as a free service available to all members. We wish a larger number of members made use of that service.

In addition to articles on domestic topics, editorial activities have covered a wide range of journals with specialized interests. Among these are professional magazines appealing to architects, municipal officials, or educational authorities; technical reviews; and trade newspapers dealing with developments in large scale catering, hotel administration, &c. Copy and illustration for nearly 100 articles have been supplied to municipal papers alone. Every member can help to give gas a good show in this powerful section of the Press by giving the Association prompt notice of new contracts and fresh enterprise in his district.

It is satisfactory to report that editors generally are willing to give prominence to gas news-items which have a genuine reader-interest. "The tone of the Press is decidedly pro-gas at present," says a recent issue of an electrical trade magazine. For instance, the Annual Conference of this Association at Sheffield received notices totalling 800 single-column inches in reputable newspapers. Wide publicity was given to the gas floodlighting during the Silver Jubilee, though this could have been largely added to, had Headquarters received photographs and material earlier. Such publicity, of course, is only made possible by members' co-operation in letting the Association have the necessary material while it is still live—or as a journalist would say, "hot" news.

Poster Campaigns.

Although some gas undertakings have for some time made use of the smaller types of posters in their showrooms and on their premises and transport, very few have shown large posters on the public hoardings. The Association has, therefore, during the past year, issued a number of posters which have been displayed in all parts of the country. These posters are a very useful link with Press advertising and form a constant reminder to the public that the Gas Industry are not behind in using all reputable publicity methods. 285 undertakings have used the Association's posters, and a number have indicated their intention of making them a permanent feature in their propaganda.

Films.

After much deliberation, the Association has considered it desirable to make available to its members sound-films which will give to the public a thorough insight into the great work done by the Gas Industry in supplying, for domestic and industrial purposes, a reliable, economical, and smokeless fuel. The films are to be shown during the Annual Conference at Edinburgh, and also in London and the leading provincial centres. A number of members have already authorized bookings and it is earnestly hoped that members will use these films to the fullest possible extent. They will provide a means of contact with existing and prospective consumers which is the nearest possible method to actual personal salesmanship, for the films will "talk" to the public, and, if properly used, will speak to millions.

Exhibitions.

British Industries Fair, Birmingham.

Owing to the change of date of the Birmingham Fair from February to May there was no Joint Gas Exhibit at Birmingham this year, although a few individual firms took stands. There was, however, at the invitation of the Fair Management Committee, a Gas Industry lunch at which there was a large gathering of members of the British Gas Federation. Consequent upon a subsequent announcement that the Birmingham Fair would revert to February, it has been decided to stage a Joint Gas Exhibit in 1936 provided suitable space can be obtained, and a new Gas Section Committee, on which the Association is represented, has been formed to make the necessary arrangements. A Joint Gas Conference will be held during the Fair.

Shipping, Engineering, and Machinery Exhibition.

The British Gas Federation Industrial Exhibit at this Exhibition was the largest and most representative selection of industrial gas appliances which has yet been shown in this country. The important work done by the Industrial Centres was shown in the various sections of the Exhibit which featured all the principal industrial uses of gas. The Exhibit was organized by the Technical Sub-Committee with the assistance of the Central Industrial Bureau which is directed by the Association.

Refrigeration Display at Charing Cross Station.

An attractive Refrigeration display was, in conjunction with the Gas Light and Coke Company, made at Charing Cross Station in June last, and was inspected by a large number of people from all parts of the country.

Building Centre.

The Building Centre in Bond Street, in which a Gas Exhibit has been organized by the Association in conjunction with the Society of British Gas Industries and the Gas Light and Coke Company, continues to attract the interest of architects and others connected with the Building Trade.

Hotel, Restaurant, and Catering Exhibition.

This Exhibition, which will be held at the end of November, will receive considerable attention from all connected with large scale cooking, and the Association has taken space in the name of the British Gas Federation for a Gas Bureau which will be a centre where all interested in Gas for large scale catering will be given the latest information.

General Propaganda and Co-operation with Members.

Local Publicity.

A feature of the Publicity Department's year has been the greatly increased demand for its services in the preparation of special booklets for local use. Most of these orders included the provision of copy, fresh designs, layout, and printing quotations. They included centenary brochures, leaflets making special offers or announcing new scales of charge, and replies to competitive propaganda.

A new volume of Local Publicity advertisements designed to standard size has been published. In addition, there has been a growing demand for special layouts varying in size from whole newspaper pages or supplements to 9-in. double-column insertions. A thousand special newspaper advertisements have been prepared for members' use during the year, apart from the stereotyped advertisements which are offered in volumes of Local Publicity.

The Publicity Department has also prepared designs for gas vehicles, for lantern slides, cinema screens, advertising

novelties, 'bus strips, 'bus tickets, account forms, letter-heads, circular letters, and library-book jackets.

District Conferences.

B.C.G.A. Conferences were held during the year at Ilfracombe, Dundee, Altrincham, York, Worcester, and Bradford. In each case reports of the proceedings appeared at length in the local papers and there were many references to them in the national Press.

Printed Propaganda.

" A Thousand-and-One Uses for Gas."

Four issues of this periodical dealt with the national housing problem and reviewed the use of gas in notable housing schemes all over the country, from the large-scale town planning activities of Glasgow, Manchester, and Birmingham to the new blocks of workers' flats in London and elsewhere. All these issues passed into a second edition.

Other issues dealt with the use of gas in clinic and sports pavilion, with domestic water-heating and space-heating, and with smoke abatement. *Christmas Fare*, the annual cookery number, was written entirely by the demonstrators of gas undertakings. Half-a-million copies were distributed by members to their consumers.

The Industrial Gas Series has been supplemented by issues dealing with plastic moulding, vitreous enamelling, and the heat treatment of steel. These embodied the co-operative work of the Industrial Gas Centres, and were widely quoted in technical reviews.

" The Flambeau."

Average sales of this quarterly propaganda magazine have reached a new high level during the year. Higher sales have enabled the Association to increase the size to twenty pages and to print on better paper without increase of cost. Many newspapers have referred to the *Flambeau* and quoted from its feature articles. Such consumers' magazines have reached a very high circulation in Continental countries, and the Committee would once again stress the fact that a wider distribution of the *Flambeau* would automatically result in an even higher standard of production and better value for money.

Sales Literature.

In 1934-5, members distributed the Association's sales literature on a bigger scale than ever before. The usual follow-up booklets, " stuffers," and pamphlets proved extremely popular. Innovations were (1) the topical booklet " Gas and Coke in the King's House," of which no less than 500,000 copies were distributed; and (2) a special booklet for prepayment consumers which ran into several editions, many of them overprinted with the name of the local undertaking.

Home Service.

The Association's Home Service Department is conducted by Mrs. Eileen Murphy. Its object is to co-ordinate methods of increasing the domestic consumption per consumer, and to give publicity to the enterprise of the Gas Industry.

During the year Mrs. Murphy has visited the districts of ninety member undertakings and delivered thirty-two public lectures. Since January, 1935, she has edited a monthly news-sheet, *Home Service*, which gives examples of fresh selling methods and new developments in consumer-relations, especially from the woman's point of view.

These Home Service activities have received notice in many provincial and national newspapers, and they have also been mentioned on the wireless.

The Home Service Department keeps contact with societies interested in women's activities, housing, home safety, &c. Several papers have commissioned articles including the " Journal of Careers." Many enquiries have been dealt with, including some from France, Germany, America, Australia, and New Zealand.

Enquiries.

The Enquiries Section of the Association, which deals with enquiries both from the general public and from members, has dealt with a wide range and a very large number of enquiries, some simple, others involved, details of which it is impossible to include in an Annual Report. Special reference should be made, however, to the close contact which has now been established between the Association and all members in relation to public lighting problems. A considerable amount of individual assistance has been rendered to many undertakings—especially those faced with serious competition. The attention which has been concentrated by the Association on both the financial and technical aspects of this problem during the last two years, has undoubtedly resulted in a fairly general improvement in our public lighting service—and a marked improvement in many cases. It has stiffened the Industry's resistance to attack, and encouraged on almost every occasion attempts to regain loads lost. Many members are now well aware, from personal experience, of the close attention to-day given to this subject by the Enquiries Officer, in conjunction, when necessary, with the Technical Adviser. There is hardly a member with whom we have not been in contact on the subject of public lighting during the last year. Consultations between members and the Association are rapidly increasing in number.

Display.

The Display department had a very busy year. Never before have so many or so varied window and showroom displays, posters, showcards, exhibition sets, backgrounds, carnival settings, been dealt with in the Association's Studio. As a result, new premises had to be and fortunately were found near to 28, Grosvenor Gardens, and in larger and more airy surroundings the Studio is more ready than ever to serve our members. A scheme for the periodical interchange of displays between undertakings in the same district has been evolved and has met with a very favourable response. Specimens of the interchange-displays will be shown at the Edinburgh Conference and the scheme will be launched in the autumn.

Numerous prizes have been won by the Studio's displays, and special Exhibits have been constructed for such occasions as the Royal Academy Exhibition of Art in Industry, the Glass Convention at Folkestone, &c.

Commercial Organization.

The Association has given considerable assistance to a number of undertakings in connection with the lay-out of new showrooms, or the re-arrangement of old ones. Information and advice have also been given on matters connected with office organization, routine forms, and the re-distribution of personnel.

Training in Salesmanship.

Through the Association the Industry has at its disposal, as members are aware, a comprehensive and practical course, based on known and proved successful sales procedure, for the training of its staff in domestic gas salesmanship. During the past year 141 students have been enrolled, bringing the total number up to 2,153. Refresher courses, of which many students have taken advantage, are available to those who have already taken the course and secured the Certificate awarded by the Association.

The Committee commend the course to the notice of all members and particularly to those whose sales staff have not had the opportunity of the training in planned selling which the scheme provides.

In the last report reference was made to the production of Text Books in which the Association was collaborating.

Volumes 1 and 2 of these text books entitled " The Science and Practice of Gas Supply "—a work covering all phases of gas distribution and utilization—are now available and are recommended to the notice of all gas executives as an essential adjunct to staff training.

The books are also offered at a specially reduced price for presentation by gas undertakings to public and other libraries, in which there is a lamentable absence of books of any sort relating to gas.

Personal.

Vice-Presidents.

The following have been added to the list of Vice-Presidents during the past year:

Alderman G. H. Barber, J.P., Chairman, City of Stoke-on-Trent Gas Department.

Alderman T. Herron, J.P., Chairman, Birkenhead Corporation Gas Department.

Obituary.

The Committee records with deep regret the loss of Mr. J. H. Ellis, Past-President, and Mr. George Geen, J.P., Vice-President. An appreciation of Mr. Ellis's services to the Association appeared in the " Bulletin " for April last.

Next President.

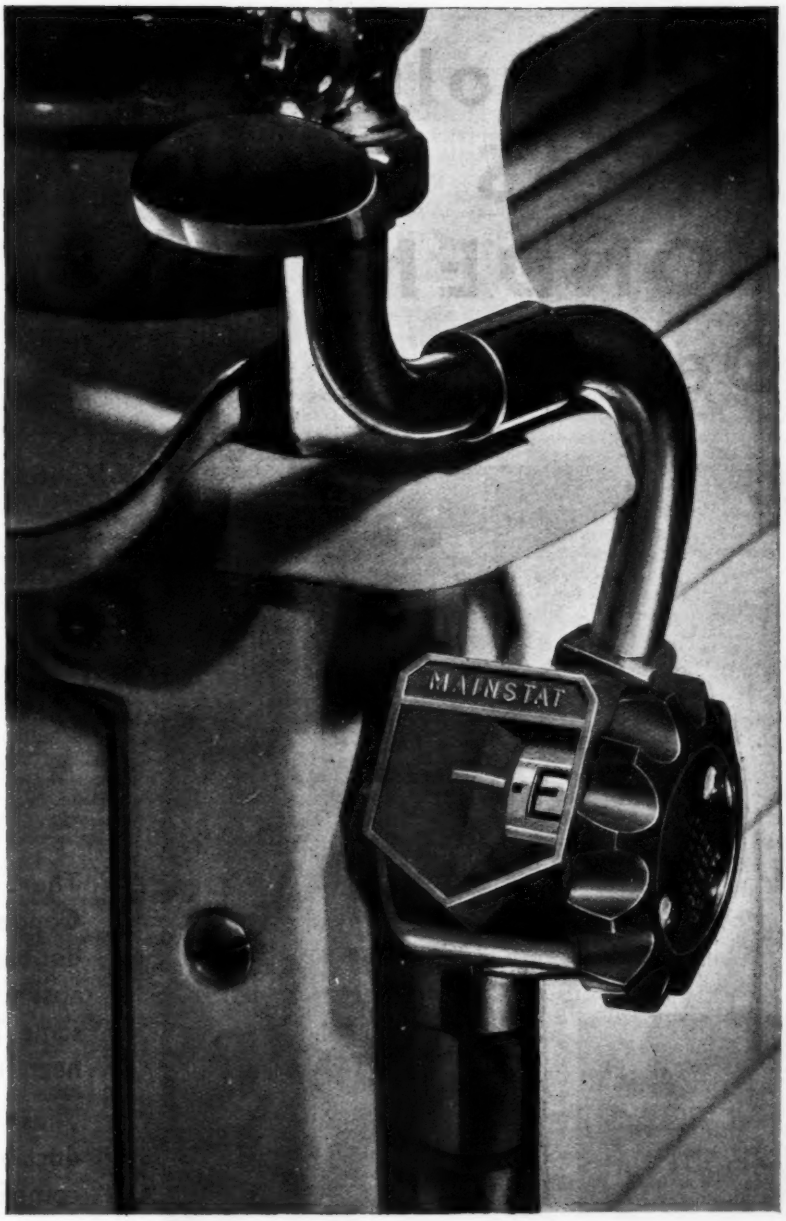
The Committee has the pleasure to report that Mr. H. Stanley Taylor, Chairman of the Bath Gas Company, has consented to be nominated for election as President for 1935-36.

WALTER MUTER,
President.
FRANCIS GOODENOUGH,
Chairman of the Executive.

Sir FRANCIS GOODENOUGH, C.B.E., moving the adoption of the Report and Accounts, said: The dominant note of the Report is one of progress and expansion, and the Accounts provide the explanation of why progress and

★

The MAINSTAT, the front-view oven control with the distinctive red dial, has done much to minimise the attention required for cooking. Its construction, as with all MAIN products, is strong and durable, while its design is neat and attractive.



Mainstat control for the widest range of gas cookers

Automatic Control on cookers differing in design as widely as the Sussex, Super Mainservor, Deluxe Mainamel, etc., gives gas undertakings a unique advantage in that they are in a position to select from a variety of gas cookers fitted with Automatic Oven Control; a variety not only in price, but in size, design and finish.

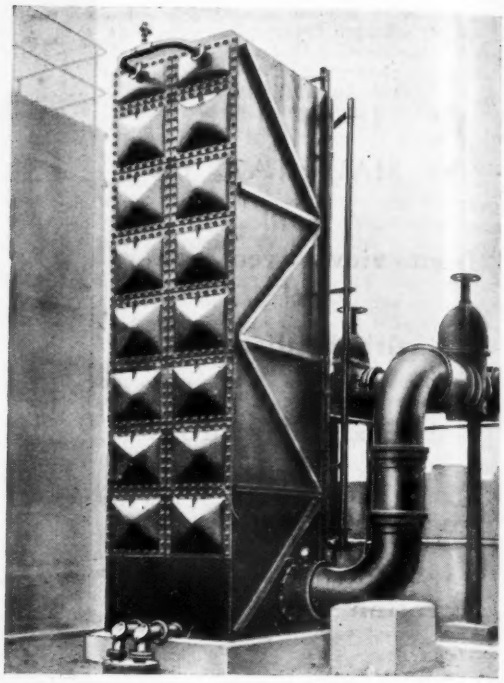
Literature for any of the above mentioned cookers available upon request.

MAIN

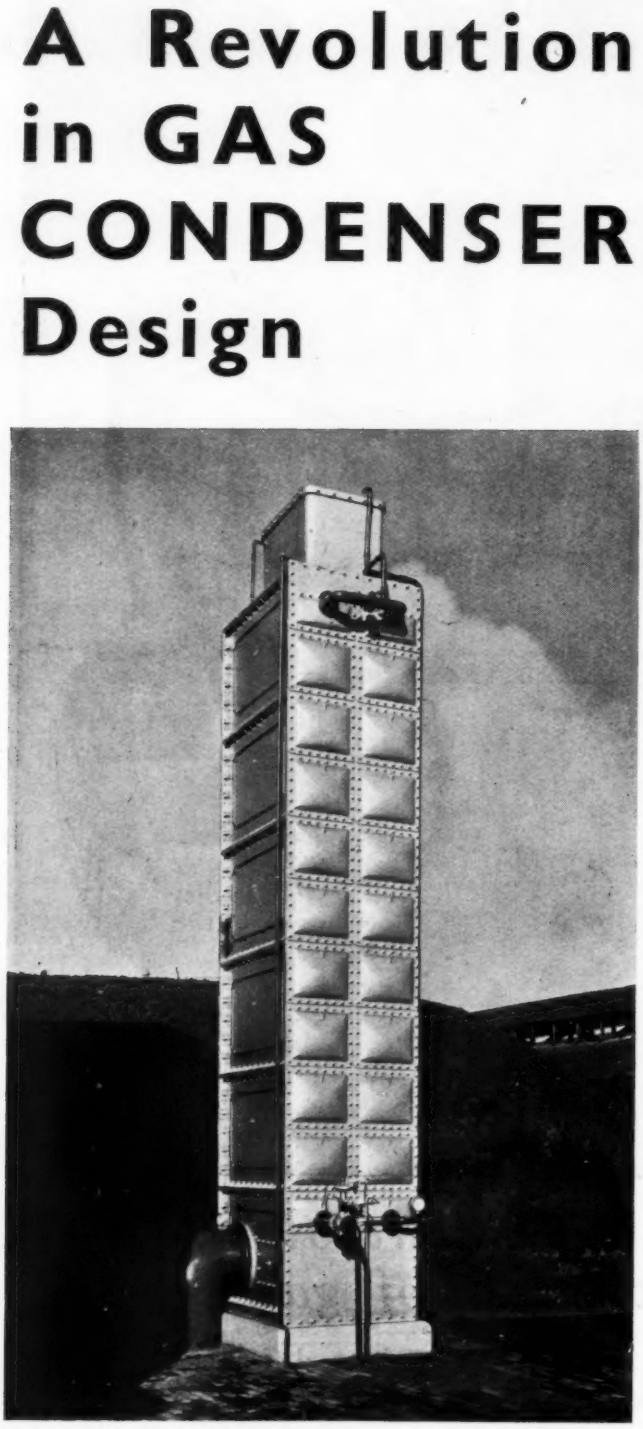
R. & A. MAIN LIMITED, LONDON AND FALKIRK

London Office and Showrooms: 48, Grosvenor Gardens, S.W. 1. Glasgow Office and Showrooms: 82, Gordon Street

A Revolution in GAS CONDENSER Design



1½ million cubic feet per diem Condenser installed by us at the East Hull Gas Works.



3 million cubic feet per diem Condenser, designed, manufactured and erected by us for the West Bromwich Gas Department.

The Thorncliffe Horizontal Tube Condenser incorporates the patent double gas deflector plates ensuring absence of slip and dead space, at the same time rendering the transfer of heat from adjacent passes impossible.

These features give a definite reduction in water consumption as compared with previous types.

The incorporation of automatic temperature control maintains a constant gas outlet temperature.

The Condensers can be of welded steel or cast iron construction.

They combine a pleasing appearance with low capital cost.

Write for full particulars and specification to :

NEWTON CHAMBERS THORNCLIFFE & Co LTD

Nr SHEFFIELD

Dickson

expansion have been possible in the past year and may be expected confidently in the future. The Industry has responded wonderfully well to the appeal of its leaders for increased means for prosecuting the work of the three great national organizations which, together with the Gas Companies' Protection Association and the Society of British Gas Industries, now comprise the British Gas Federation. It responded wonderfully well, but not yet to the fullest possible extent, and I should like to give voice as earnestly as I can to a reiterated appeal to each and every gas undertaking to play its part fully in providing the money without which the defence and development of the Industry during the critical years immediately ahead of us cannot, as effectively as possible, and in the greatest degree possible, be conducted and achieved. This is not a question of " subscription " to some organization or enterprise or charity outside the actual scope and purpose of the Industry. It is a question of bearing one's share of the cost of work done centrally by the national bodies for the certain benefit and ultimate advancement of each and every one engaged in the Industry.

I wish the word " contribution " could be substituted in our vocabularies and in our minds for the word " subscription." There is no question of demanding or enforcing the payment of each undertaking's fair share of the needful expenditure—it is a matter of an appeal to honour and fairplay rather than of coercion. But we who are responsible for the effective pursuit of our common purposes on behalf of the Industry—the technical research and educational work of The Institution of Gas Engineers, exceedingly well done at most moderate cost; the parliamentary and similar " watch-dog " work of the National Gas Council, done most effectively, with a minimum of fuss and splash, at a minimum of cost by a most efficient and hard-working staff; and the publicity, advertising, lecturing, and commercial development and educational work, done by this Association, as extensively and competently as means permit, by a growing, skilled, and tremendously keen staff—to whom I am glad to have the opportunity as its head to pay an unstinted and most sincere tribute—we, I have said, who are responsible for the work, combined and individual of those organizations, do most emphatically ask you to believe that that work cannot be carried out for the Industry, effectively and powerfully, at a less cost than is represented by the rate of contribution asked for from each undertaking—namely, of ten shillings per million cubic feet of gas made. Twice that sum could, in my personal belief, be spent to the advantage of all, if all would pay their share, for the work of maintaining the present prosperity and of developing that prosperity still further, as it can and should be developed, will be not less but more strenuous and costly in the near future than it has been and at present is.

Unprecedented Development Ahead.

I have no doubts or fears about the successful maintenance and unprecedented development of the Gas Industry in the years immediately before us. I only pray that I may be spared to play my part in the work that will be called for in ensuring that success, if I am desired to play such part by the Industry I love so well. It may not be out of place if I here attempt a condensed answer to the question, which is often put, wonderingly, by one's friends, by public men and women and by the general body of citizens and business people. That question is:

How is it that, in spite of growing competition; in spite of the development of electricity; in spite of the unwarranted partiality shown and expressed by national and local governments for electricity; in spite of the attraction to many of the new and, supposedly, more wonderful, and temporarily more fashionable, source of light, heat, and power; in spite of all its handicaps and obstacles, how is it that gas continues to prosper and progress in an amazing—and, to many, so disconcerting a—fashion? Gas has been said to be " doomed " for many years. Why is it such an unconscionable while a-dying? Why is it, indeed, that it shows no signs of dying, but is healthy and flourishing? Why is it that in regard to electricity, cheap, abundant and reliable, man " never is, but always to be, blest? " I suggest that the reasons are several and fundamental. *First*, because gas is the cheapest and by far the most reliable means of converting the potential heat of coal into a form easily conveyed to and conveniently employed by man. *Second*, because the Gas Industry, as a public utility enterprise, has long ago cut the word " monopoly " out of its vocabulary and substituted the word " service " in its place. *Third*, because the Gas Industry interprets, in ever-growing measure, the word " service " as the study and efficient satisfaction of the needs of the customer, accompanied by courtesy of treatment and the genuine desire and intention to *satisfy* to the full extent (and even to beyond the full extent) of equity and justice. *Fourth*, because, for the purpose of affording such service and ensuring such satisfaction, the Gas Industry has taken and is in growing measure taking steps to secure officers and men of all ranks thoroughly well educated and efficiently trained, technically and commercially, for the rendering of that quality of service which alone can ensure that 100% of consumer satisfaction that is the foundation, the enduring foundation, of all commercial prosperity. *Fifth*, because the Industry takes organized steps to inform the public, consistently and persistently, in the mass and as individuals, of the services, the innumerable and invaluable services, gas can render in home, in public service, in commerce and in industry, and to advise them how most economically and efficiently gas can be used for these various purposes so that the consumer may obtain the greatest value for his money.

You will not find it difficult, in considering these five reasons for prosperity and progress, to trace the work of the three great national organizations to which I have referred, and I hope you will feel that in that work, that fundamental work, this Association has played, can play, and I feel sure will receive the support necessary to play in the future, no inconsiderable part.

One Note of Warning.

Let me, however, interpolate one note of warning and counsel. Do not, I beg you, any one of you think that, for the achievement of the progress and increased prosperity which I believe can and will be achieved, individual undertakings can or should rely solely upon the work of the central national organizations. These organizations, like Providence, can best—indeed, can only—help those who help themselves. Every single undertaking, company or municipal, must adopt and put into effect for itself, in its own area, the " service-to-consumer-first " policy to which I have referred; must make full use of the facilities provided and assistance given by The Institution of Gas Engineers and this Association for the technical and commercial education of their officers and men so that they may be qualified to give perfect service to the customer; and must give every encouragement and reward to those availing themselves of those facilities. It is seriously discouraging to those who give freely of their energies, thought, and time to the organization of the means of helping undertakings, to observe little or no readiness by some of those undertakings in this matter of education to play their part by making use of those means.

In publicity, there must be local and district effort to back up and get full effect from national effort. In short, if we are to achieve the progress and win the victories we can achieve and win, it must be truly a case of each for all, all for each, and everyone for themselves. Then if we work unceasingly and vigilantly, one and all, we shall achieve a degree of progress that will astonish even the most optimistic of us.

It is most gratifying to us who believe it to be fundamental to the well-being and progress of the Industry that a sound policy of salesmanship and service should be adopted and put actively and persistently into practice by every gas undertaking; that prominence was given to the prime importance of sound selling methods and of competent education and training in salesmanship in some of the most important of the Papers or Addresses recently presented: *e.g.*, to the Annual Meeting of The Institution of Gas Engineers, to the North British Association's Annual Meeting, and to the North of England Gas Managers' Association.

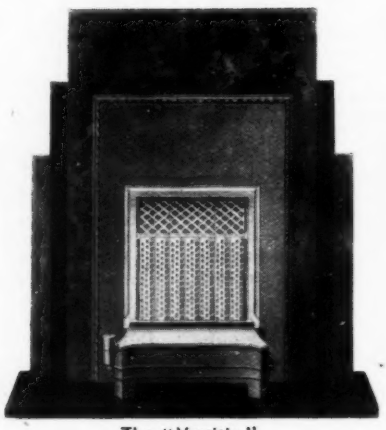
Our thanks are due to Colonel Carr, The Institution of Gas Engineers' President, whom we so gladly welcome as our First Vice-President, here and in London, to Mr. S. B. Chandler, Mr. Thomas Carmichael, and Mr. W. M. Galleway, for giving engineers and managers everywhere food for thought and stimulus to action that will bear much fruit, I am positive, in years to come.

Very significant and very hopeful is the growing recognition of the truth that unless you market efficiently it is of little avail to manufacture skilfully. In other words, the salesman secures the employment of the engineer.

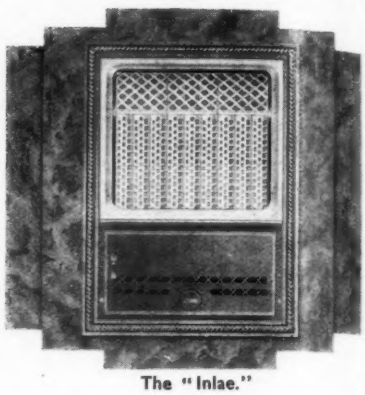
For the highly trained and skilled engineer I have the highest admiration and respect—and I want the Industry in which he is engaged to flourish exceedingly. Therefore, I say: Let Scientific Salesmanship flourish wherever there is a gas-works and a network of distributive mains and services. We are *in business*, not merely in a technical profession. Let us realize that fully, before our competitors, of whom it is equally true, realize the truth for themselves.

New High "Beam" Gas Fires by John Wright & Co.

The "Little Aston."



The "Varsitie."



The "Inlae."

An attractive and comprehensive gas fire list has been produced recently by Messrs. John Wright & Co., Ltd. (Radiation Ltd.). The list is printed in the pleasing style which characterizes this firm's literature, and embraces the complete series of High "Beam" fires, several new designs being included for the first time.

In this season's list a new note is struck, the various fires being shown in attractive settings. An eight-page inset in colour illustrates a series of facsimile marble surrounds consisting of five designs which are available in four colours and black. Architects and consumers who are considering the complete installation of a gas fire suite are thus able to form a good idea of the appearance of these High "Beam" fires when placed in appropriate settings. Surrounds are shown for both built-in and hearth types, and altogether this list will be found of great help to all who are interested in modern gas fire installations.

The new designs include the "Standard"—a dignified and well proportioned fire that will suit any style of interior. This fire is made in 6, 7, 9, and 12-radiant sizes, the latter size making a fire of particular effectiveness and imposing appearance. The "Little Aston"—another new model—is a neat 5-radiant fire for rooms of smaller proportions. It is noticeable that all the characteristics of larger High "Beam" fires have been retained in this 5-radiant model. The "Little Aston" will have a wide appeal, for even the tiniest room can now have its High "Beam" fire. Another new pattern, with round top, is the "Vanitie." This fire has been designed for fitting into a surround opening of similar shape.

This new list provides further evidence of the high standard of craftsmanship which Messrs. John Wright & Co., Ltd., employ in the production of their High "Beam" gas fires.

Automatic Control Systems for Coke-Fired Boilers

The growing demand for thermostatic control of coke-fired boilers has lead to the development, pioneered by the Gas Light and Coke Company, of a system of automatic damper operation by thermostat and pressurestat.

From time to time in these columns we have published descriptions of coke-fired boiler installations of various types, which by reason of their size or particular applications have appealed to us as being of general interest. On such occasions, while pointing out that automatic damper control is provided on the boilers, little further reference has been made to this most vital feature of the installation—a feature which in many instances must have turned the scales in favour of apparatus designed to use our chief by-product rather than any rival form of fuel.

It will now be universally agreed that, if coke is to compete on equal terms with other fuels in large-scale heating work, automatic control is essential to avoid over-heating and the need for constant attention. Several systems of control exist to-day, one of which was described in some detail in the "JOURNAL" for Aug. 29 of last year by Dr. F. M. H. Taylor, Ph.D., in his series of articles dealing with specialized phases of the gas coke market. Reference to this article will give details of a thermostatic damper control fitted to a cast-iron sectional boiler, together with a diagram showing the circuit for the G.L.C. system of damper control. As Dr. Taylor then pointed out, the fitment of thermostatic control to coke boilers has brought a great many advantages. It has meant a reduction in fuel consumption of 15% and sometimes much more. It has increased the efficiency of the water heating, since both under-heating and over-heating of an effectively designed system can easily be avoided. A reduction in the amount of labour and attention—an important factor for both large and small installations—has been effected, while the formation of clinker and boiler scale has been greatly reduced.

Specialists in Boiler Control.

Many types of thermostats and specialized equipment applicable to coke-fired boilers are being put on the market by various manufacturers at the present time, and this fact alone may make a decision as to which type will be most suitable for any particular installation a difficult one for the gas undertaking concerned.

The application of these controls to the numerous types of boilers on the market is specialized work, calling for the services of a specialist organization. For this reason, and for the purpose of assisting gas undertakings, heating engineers, boiler makers, and others, an organization known as Thermocontrol Installations Company, Ltd. (with headquarters at 28, Victoria Street, S.W. 1), has been formed with the co-operation of the London and Counties Coke Association and the Gas Light and Coke Company, and has carried out installations in various parts of the country, including Winchester Cathedral; Manor Fields Flats, Putney; Hutton Grammar School, Preston; Red Cedars Nurseries, Worthing; and elsewhere. It will be recalled that the two first-mentioned installations have been described in detail in the "JOURNAL" during the past few months.

This modern development is one which may well repay the attention of gas undertakings which are anxious to

This Notice is not an invitation to the public to subscribe, but is issued in compliance with the regulations of the Committee of the Stock Exchange, London, for the purpose of giving information to the public with regard to the Company. The Directors collectively and individually accept full responsibility for the accuracy of the information given.

UNITED KINGDOM GAS CORPORATION, LTD.

(Incorporated under the Companies Act, 1929.)

SHARE CAPITAL - - £1,500,000

Authorised:	Issued or proposed to be issued:
£500,000 in 500,000 4½ per cent. Cumulative Preference Shares of £1 each	£229,831
£500,000 in 500,000 Preferred Ordinary Shares of £1 each (entitled to a fixed non-cumulative dividend at the rate of 4½ per cent. per annum)	£206,671
£500,000 in 500,000 Ordinary Shares of £1 each, 15s. paid (the final call of 5s. per Share has been made and is due and payable on 4th November, 1935)	£500,000
£1,500,000	£936,502

DEBENTURE STOCK

Authorised:	Proposed to be issued:
£400,000 3½ per cent. Debenture Stock	£400,000

Trustees for the 3½ per cent. Debenture Stockholders:
THE PRUDENTIAL ASSURANCE COMPANY LIMITED, Holborn Bars, London, E.C.1.

Directors:
RICHARD BRUCE HAMILTON OTTLEY, 48, Seymour Street, London, W.1 (Director of Erlangers Limited), *Chairman.*
COLONEL WILLIAM MONCRIEFF CARR, O.B.E., T.D., M.Inst.Gas E., Stretford, nr. Manchester, Lancs. (Consultant Gas Engineer).
ANGUS VALDEMAR HAMBRO, J.P., Merly House, Wimborne, Dorset.
HENRY FRANK HARDING JONES, The North House, Clareville Grove, London, S.W.7 (Director of Wandsworth and District Gas Company).
MICHAEL HUBERT TETLEY, M.I.Mech.E., The Priory, Stevenage, Herts. (Director of Imperial Continental Gas Association).
JOHN MICHAEL WHITTINGTON, The Flint House, Goring Heath, Oxon. (Director of South Western Gas & Water Corporation Limited).

Bankers:
HAMBROS BANK LIMITED, 41, Bishopsgate, London, E.C.2.
ERLANGERS LIMITED, 4, Moorgate, London, E.C.2.
BARCLAYS BANK LIMITED, 54, Lombard Street, London, E.C.3.

Solicitors:
HERBERT SMITH & CO., 62, London Wall, London, E.C.2.

Auditors:
DELOITTE, PLENDER, GRIFFITHS & CO., Chartered Accountants, 5, London Wall Buildings, London, E.C.2.

Brokers:
HAES & SONS, 124, Old Broad Street, London, E.C.2.

Managers, Secretaries and Registered Office:
CLOSE BROTHERS LIMITED, 9, Clements Lane, Lombard Street, London, E.C.4.

PARTICULARS relating to:
£400,000 3½ per cent. Debenture Stock,
229,831 4½ per cent. Cumulative Preference Shares of £1 each,
206,671 Preferred Ordinary Shares of £1 each.

The £400,000 3½ per cent. Debenture Stock was created by a Resolution of the Directors dated the 17th day of September, 1935, and will be in registered form and transferable in multiples of £1. The Stock will be constituted by Trust Deed in favour of the Prudential Assurance Company Limited as Trustees for the Debenture Stockholders. The Trust Deed will constitute a floating charge upon the undertaking and assets of the Company, both present and future, including uncalled capital. By the Trust Deed, the Company will reserve to itself the power to create and issue further Debenture Stock for any amount not exceeding in the aggregate with the said sum of £400,000 a sum equal to one-half of the nominal amount of the issued share capital of the Company for the time being and carrying interest at a rate not exceeding 5 per cent. per annum, ranking *pari passu* in all other respects with the Stock secured by the Trust Deed.

Save as aforesaid and except as hereinafter mentioned, the Company will be precluded from creating any mortgage or charge upon all or any of its assets ranking in priority to or *pari passu* with the charge created by the Trust Deed provided that the Company will be at liberty to create any mortgage or charge upon the whole or any part of its assets ranking in priority to or *pari passu* with the charge created by the Trust Deed for the purpose of securing temporary loans or overdrafts from its bankers in the ordinary course of business, but so that the amount secured by any such charge as aforesaid together with the amount of any outstanding Debenture Stock shall not at any time exceed one-half of the nominal amount of the issued Share Capital of the Company for the time being.

The whole of the Debenture Stock is redeemable at a premium of 2 per cent. on the First day of October, 1960. Interest will be payable half yearly on the First day of April and the First day of October in each year. The first payment of interest, calculated from the dates of allotment, will be paid on the 1st April, 1936.

Share Capital: DIVIDEND RIGHTS.—The profits of the Company available for dividend and determined to be distributed in respect of each year are to be applied in order of priority in the following manner:—

(*a*) To the payment of a fixed cumulative preferential dividend at the rate of 4½ per cent. per annum on the capital for the time being paid up or credited as paid up on the Preference Shares.

(*b*) Subject thereto to the payment of a fixed non-cumulative preferential dividend at the rate of 4½ per cent. per annum on the capital for the time being paid up or credited as paid up on the Preferred Ordinary Shares, and

(*c*) Any balance of such profits remaining after the distributions aforesaid shall be divided amongst the holders of the Ordinary Shares in proportion to the amounts paid up or credited as paid up thereon respectively.

CAPITAL RIGHTS.—In the event of the Company being wound up the surplus assets available for distribution amongst the Members are applicable in the order of priority and manner following, that is to say:—

First to the repayment to the holders of the Preference Shares then issued and outstanding of the amounts for the time being paid up or credited as paid up on such shares together with all arrears of the fixed cumulative preferential dividend whether declared or undeclared down to the date of such repayment.

Secondly to the repayment to the holders of the Preferred Ordinary Shares then issued and outstanding of the amounts for the time being paid up or credited as paid up on such shares.

Thirdly, the residue shall be distributed amongst the holders of the Ordinary Shares in proportion to the amounts paid up or credited as paid up on such shares respectively.

VOTING RIGHTS.—Neither the Cumulative Preference Shares nor the Preferred Ordinary Shares confer the right to receive notice of or attend and vote at General Meetings except (*i*) in the case of proposals to wind up the Company or to alter the Articles of Association in any manner directly affecting the rights and privileges attached to such shares respectively: (*ii*) if the dividend on the Cumulative Preference Shares shall be in arrear for more than six months from the half-yearly dates fixed for payment thereof, viz.: 1st June and 1st December and then only for so long as the dividend shall remain unpaid. Subject as above on a show of hands every Member present at a meeting of the Company shall have one vote and on a poll every Member present in person or by proxy shall have one vote for every share held.

The creation and issue by the Company of further Cumulative Preference and Preferred Ordinary Shares (conferring the right to a dividend at such rate as may be determined not exceeding 7 per cent., but ranking in all other respects *pari passu* with the Cumulative Preference and Preferred Ordinary Shares respectively), can be effected without any consent of the Cumulative Preference, Preferred Ordinary or Ordinary Shareholders provided that the amount of the Cumulative Preference Shares for the time being issued does not exceed the total amount of the Preferred Ordinary and Ordinary Shares for the time being issued."

The Corporation was incorporated in England under the Companies Act, 1929, on the 25th January, 1935, as a private company with a capital of £100 and was converted into a public Company and the capital increased to £1,500,000 by a Special Resolution passed on the 14th February, 1935.

The objects of the Corporation are as specified in its Memorandum and Articles of Association and are, in particular, the acquisition of shares, securities and interests in gas, electricity and water companies and undertakings and the management and development of the same in the United Kingdom.

An associated Company called Caledonian Gas Corporation, Ltd., was formed on the 21st February, 1935, to carry out similar objects in Scotland, and the United Kingdom Gas Corporation, Ltd., owns over 99 per cent. of the issued Ordinary Share Capital of that Corporation to which it has also made a loan of £75,455.

The Caledonian Gas Corporation, Ltd., has acquired (*inter alia*) majority holdings in eleven Scottish Gas undertakings.

In pursuance of its objects as stated above, and in addition to its holding in the Caledonian Gas Corporation, Ltd., the Corporation has already acquired or agreed to acquire controlling interests in the following gas undertakings: Ormskirk District Gas Company, Rhymney & Aber Gas Company, Bridlington Gas Company, Woburn Gas Light Company Limited, Scarborough Gas Company and Aylesbury Gas Company.

The above investments have been made in different areas and with a view to the formation in such areas of groups of gas undertakings.

The Corporation has also made investments in other gas undertakings situated in selected areas.

[*Continued on next page*]

UNITED KINGDOM GAS CORPORATION, LTD.

Continued from p. VII.

The total cost to the Corporation of its investments (including the above loan, compensation paid to Directors of Subsidiary Companies and acquisition expenses) is £1,198,555.

It is now proposed to issue for cash £400,000 3½ per cent. Debenture Stock at par and 100,000 Preferred Ordinary Shares of £1 each at 21s. per share, the net proceeds of which it is intended to utilise in repayment of temporary unsecured loans from Bankers, in completing the purchase of investments already acquired or agreed to be acquired and for financing future acquisitions. The Corporation is now in the course of negotiating for the acquisition of interests in further gas undertakings.

The Directors' borrowing powers are exercisable without the sanction of a General Meeting, provided that the amount for the time being remaining outstanding of moneys borrowed or raised by the Board for the purposes of the Company (otherwise than by the issue of share capital, by unsecured overdraft facilities granted by bankers, or by charges or liens on goods or mercantile documents in favour of bankers and others effected in the ordinary course of business) shall not at any time without the previous sanction of an Extraordinary Resolution of the Company exceed one-half of the nominal amount of the share capital of the Company for the time being issued and outstanding.

The following Contracts, which are or may be material, have been entered into:—

(1) Dated 26th February, 1935, between the Corporation and Close Brothers Limited appointing Close Brothers Limited sole negotiating agents of the Corporation for seven years from 15th February, 1935, to negotiate for the acquisition of and interests in Gas Companies and undertakings in the United Kingdom at a remuneration of 2 per cent. of the amount paid whether in cash or otherwise by the Corporation for acquisitions of any gas or other undertakings and interests therein. By contract dated 27th February, 1935, Close Brothers Limited have agreed to pay to Hambros Bank Limited, Erlangers Limited, and Philip Hill & Partners Limited, one-quarter of such remuneration in consideration of services to be rendered by them in connection with such negotiations.

(2) Dated 26th February, 1935, between the Corporation and Close Brothers Limited appointing Close Brothers Limited Managers, Secretaries and Registrars of the Corporation for seven years from the 15th February, 1935, at an annual remuneration of one-quarter of one per cent. upon the amount of the issued Share and Loan Capital of the Corporation for the time being; Close Brothers Limited are also to be repaid all travelling and other special out of pocket expenses.

(3) Dated 26th February, 1935, between the Corporation and Hambros Bank Limited, Erlangers Limited and Philip Hill and Partners Limited appointing such companies financial advisers to the Corporation for a period of seven years from the 15th February, 1935, at a remuneration therefor and for other services in connection with issues of capital of the Corporation equal to 1 per cent. of the amount of all issues, including premium (if any) whether for cash or otherwise of share and loan capital made by the Corporation.

The following commissions have been or will be paid by the Corporation in connection with the issue of Share and Loan Capital:

(*a*) In accordance with the provisions of Contract No. 3 above mentioned, the Corporation has paid or will pay 1 per cent. on all issues to the parties therein mentioned.

(*b*) A brokerage of ¼ of 1 per cent. on 500,000 Ordinary Shares subscribed at par.

(*c*) A brokerage of ¼ of 1 per cent. and a commission not exceeding ½ of 1 per cent. on the issue price of £400,000 3½ per cent. Debenture Stock at par and a brokerage of ¼ of 1 per cent. on the issue price and a commission not exceeding 3d. per share on 100,000 Preferred Ordinary Shares of £1 each at 21s. per share.

The following are the prices at which the Corporation's Share and Loan Capital has been issued or is proposed to be issued:—

500,000 Ordinary Shares of £1 each issued for cash at par; 229,811 Cumulative Preference Shares have all been issued at the following prices and are fully paid: 16,046 at 21s. per share, of which 13,414 were issued credited as fully paid and 2,632 for cash; 69,261 at 21s. 6d. per share, of which 65,999 were issued credited as fully paid and 3,262 for cash; 7,406 at £1 0s. 11.43d. per share, of which 5,714 were issued credited as fully paid and 1,692 for cash; 12,541 at £1 1s. 7.95d. per share all issued credited as fully paid; 124,577 at £1 1s. 8.4d. all issued credited as fully paid. 106,671 Preferred Ordinary Shares have been issued at the following prices and are fully paid: 93,394 at par, of which 91,923 have been issued credited as fully paid, and 1,471 for cash; 13,277 at £1 1s. 2.35d. per share, all issued credited as fully paid. 100,000 Preferred Ordinary Shares now proposed to be issued for cash at 21s. per share and £400,000 3½ per cent. Debenture Stock now proposed to be issued for cash at par, both payable in full on application.

All the above shares issued credited as fully paid were issued as part consideration for the investments above referred to acquired by the Corporation. All the above Cumulative Preference Shares and 106,671 Preferred Ordinary Shares rank for dividend as from 1st July, 1935, and the 100,000 Preferred Ordinary Shares now proposed to be issued will rank for dividend as from the dates of allotment.

None of the Share or Loan Capital of the Corporation is under option or agreed to be put under option.

The following documents are open for inspection at the offices of the Solicitors to the Corporation, Messrs. Herbert Smith & Co., 62, London Wall, London, E.C.2, for seven days from the date of the publication of this advertisement: the Memorandum and Articles of Association; a draft (subject to modification) of the proposed Trust Deed, and the Contracts above mentioned.

Dated 27th September, 1935.

Theory of Industrial Gas Heating

By PETER LLOYD, B.A.Cantab., A.I.C.

This book represents, we believe, the first attempt to work out the general theory of industrial gas application, and it includes information which will be of interest not only to salesmen and students, but also to designers, manufacturers, and users of industrial gas equipment.

Price 6/- post free

WALTER KING, LTD., 11, BOLT COURT, FLEET STREET, LONDON, E.C.4

find increased markets for their coke. The general demand for automatic control of central heating and hot water supply installations is liable to create a preference for other fuels unless the application of such control to coke-fired boilers is made more generally known. Coke salesmen can avail themselves of the services of the organization mentioned so far as recommendations as to the best method of control to meet specific requirements is concerned, and also in connection with the actual installation work.

An Unbiassed Choice.

A fundamental principle of Thermocontrol Installations Company is that there is no commitment to the sale or marketing of any particular control apparatus, with the result that an unbiassed selection can be made of what is considered the best control or combination of controls to meet the particular case under consideration.

Satisfactory results do not depend, however, solely upon the correct selection of the controls; but also upon their correct application. The fact, therefore, that the Company undertakes to supply and install the necessary equipment in co-operation with any main contractor concerned is naturally of considerable advantage to all the interested parties. It is clear, moreover, that the Company are not working in any way in competition with heating engineers, who are enabled to make their profit on the installation work in the ordinary way.

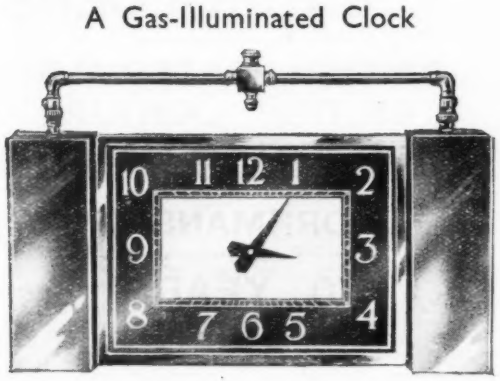
The controls, for the most part, operate electrically, and provision is made for safeguarding the boiler plant against over-heating in the event of current failure. The boiler dampers are controlled primarily by a thermostat responding to the temperature of the water in the boiler; but the control can be extended, if desired, to operate from room thermostats or from the temperature of the water in the storage tank. In the case of a boiler or group of boilers serving hot water radiators for central heating and also a domestic hot water supply the controls can be arranged to give preference to whichever service is the more important, and to close down the boiler to " no load " conditions when both are satisfied.

Night Operation.

Arrangements can also be made to change over automatically to a lower boiler temperature during the night and back again in the early morning to the temperature conditions required for the day time. Other controls vary the boiler temperature according to the outside temperature, thus anticipating changes due to the vagaries of the weather and tending to maintain more even temperature conditions in the rooms.

There is, in fact, tremendous scope for thermostatic control in conjunction with coke-fired boiler installations. The systems can be arranged to meet almost any conceivable temperature conditions, and a considerable number of new and existing boilers of various types have been equipped with such controls with excellent results. Only a few of the general principles of the subject have been touched upon here, as our object has been primarily to introduce a new service to the Industry, which may well prove of considerable assistance in the steadily growing field of coke heating in which we are all interested at the present time.

A Gas-Illuminated Clock



This novel " Veritas Internalite " gas-illuminated clock sign is one of the most recent productions of Messrs. Falk, Stadelmann, & Co., Ltd. The burners are enclosed in chromium-plated metalwork, the whole, of course, being finished similarly, giving an extremely neat and attractive appearance. The face of the clock is effectively thrown into bold relief by the concealed light sources either side.

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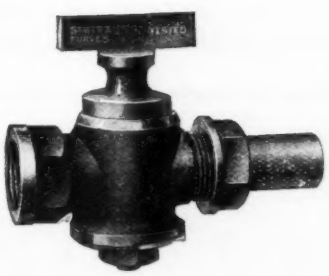

No. 119.

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THE STANTON-WILSON SELF-ADJUSTING PIPE JOINT enables over 500 miles of spun iron mains to adjust themselves to the subsoil movements caused by ground subsidence and traffic vibration. Owing to the flexibility of the joints, these mains were laid with very few specials.

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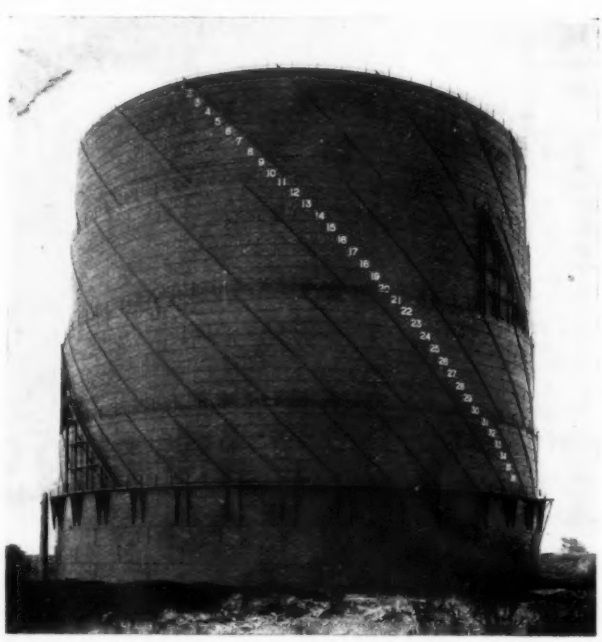

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

Although there was no change in the international situation, markets generally were brighter last week. This can be attributable mainly to the fact that prices had fallen to such levels as to become attractive again, and with buyers more in evidence and supplies short, prices rapidly responded. The movements, however, were erratic, but the tone was strong enough for securities in most sections to close higher on the week. Markets are now in a position that if, happily, some definite signs are forthcoming of any settlement of the present international deadlock an instantaneous all-round rise in values would ensue.

Attention has previously been drawn in this Report to the consistent steadiness of the Gas Market during the present critical period as compared with many other sections, and last week was no exception to the general rule. There was a longer list of recorded transactions, and prices generally were well maintained. Imperial Continental quickly recovered the previous week's set-back and closed 5 points up at 210—business being done at 214. It is satisfactory to note also that South Metropolitan 6% preference changed hands at 152, or 2½ points higher than last week's best and only 1 point below the highest price reached during 1934—the quotation remaining unchanged at 147-152. As regards the Company's ordinary stock, the margin has been increased from 3 to 5 points, leaving the middle market price the same at 125½. Apart from *ex* div. reductions the only fall of note was a drop of 5½ in Oriental ordinary to 165, at which price the yield on a dividend of 8%, free of tax, works out at 6¼%. Gas Light units eased a further 3d. to 26s. 9d.

Current Sales of Gas Products

The London Market for Tar Products.

Sept. 30.

Current prices of tar products are as follows:
Pitch, about 32s. 6d. per ton f.o.b.
Creosote, about 6d. per gallon.
Refined tar, 4d. per gallon in bulk at makers' works.

The demand for pure toluole continues good, the price being not less than 2s. 3d. per gallon; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 1s. 6d. to 4s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

Sept. 30.

The average prices of gas-works products during the week were: Gas-works tar, 18s. to 23s. Pitch—East Coast, 31s. to 33s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. to 33s.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6¾d. to 7d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 5½d. Heavy naphtha, North, 11d. to 11½d. Creosote, *ex* works, in bulk, North, liquid and salty, 5¼d. to 5½d.; low gravity, 5d. to 5¼d.; Scotland, 5d. to 5¼d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid, 60's, 1s. 11d. to 2s. Naphthalene, £11 to £13. Salts, 65s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Sept.* 28.

There is more activity generally, but actual values remain practically unchanged.

Crude gas-works tar.—The actual value is 26s. to 28s. per ton *ex* works in bulk.

Pitch remains quiet at 30s. per ton f.o.b. Glasgow for export, and 30s. per ton *ex* works in bulk for home trade.

Refined tar is valued at about 2¾d. per gallon f.o.r. in buyers' packages, and, while home business is very quiet, export enquiries are more numerous.

Creosote oil.—New business is not easy, but stocks are low and prices are maintained. B.E.S.A. Specification, 5⅛d. to 5⅜d. per gallon; low gravity, 5¼d. to 5½d. per gallon; and neutral oil, 5½d. to 5¾d. per gallon; all f.o.r. in bulk.

Cresylic acid maintains its position with values as follows: Pale, 97/99%, 1s. 2d. to 1s. 3d. per gallon; dark, 97/99%, 1s. 0½d. to 1s. 1d. per gallon; and pale, 99/100%, 1s. 3d. to 1s. 4d. per gallon; all *ex* works naked.

Crude naphtha is only available in small quantities which command 4½d. to 5d. per gallon f.o.r., according to quality and district.

Solvent naphtha.—Supplies are not too plentiful. 90/160 grade is 1s. 3½d. to 1s. 4d. per gallon, but heavy naphtha, 90/190, has appreciated to 11d. to 1s. per gallon.

Motor benzole is well sold and value is purely nominal at 1s. 3½d. to 1s. 4d. per gallon in bulk at makers' works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade is 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	9½	to	0	10	per gallon at works
Motor ,,	1	3	,,	1	3½	,, ,, ,,
90% ,,	1	4	,,	1	4½	,, ,, ,,
Pure ,,	1	7½	,,	1	8	,, ,, ,,

Contracts Advertised To-Day

Boilers (Waste Heat).
Bury Gas Department. [p. 50.]

Compressors.
Darlington Gas Department. [p. 50.]

Gasholder (Waterless).
Rotherham Gas Department. [p. 50.]

Liquor Concentration Plant.
Blackpool Gas Department. [p. 50.]

Trade Notes

New C.W.G. Plant at Faversham.

Messrs. Humphreys & Glasgow, Ltd., have recently received an order for one of their latest type of automatically operated carburetted water gas sets from the Faversham Gas Company.

Drakes Verticals for Newport (I.O.W.).

We are informed that Drakes, Ltd., Halifax, have secured the contract from the Newport (I.O.W.) Gas Company for their new vertical installation consisting of eight 5-ton retorts complete with new retort house and subsidiary plant.

New Type of Mild-Steel Gilled Tube.

A new departure in mild-steel gilled tubing, with distinct advantages for heating, cooling, humidifying, and air-conditioning is the "Harco" hot-shrunk tapered gilled tube. This new type of gill has no crimp and is twice as wide at the bottom of the gill as at the outside edge, the cross-section of the strip being tapered. The gill is wound on the tube at a cherry-red temperature and in cooling shrinks tightly on to the tube. It is claimed that efficiency or rate of heat transfer is approximately 25% greater than for a crimped gilled tube. "Harco" hot-shrunk tapered gilled tubes are manufactured by G. A. Harvey & Co. (London), Ltd., of Woolwich Road, London, S.E. 7, who issue a useful data sheet, which they will be pleased to send on request.

A Catalogue of Boiler Accessories.

Messrs. Hunt & Mitton, Ltd., of Birmingham, have just published an entirely new edition of their catalogue of steam valves, boiler mountings, lubricators, and kindred fittings, which in its revised form constitutes a very comprehensive publication. It is very fully illustrated and provides all essential information relative to the firm's products. For quick reference to the various headings there is a summarized index on the cover page with arrows pointing to thumb tags which mark the beginning of each particular section. Catalogue numbers have been revised so that they can be grouped into sections and brought into better numerical order. The catalogue as a whole indicates the steady development which has taken place since the firm's last publication, particularly as regards the advancement along the lines of forged steel valves and fittings for the high steam pressures and temperatures now in vogue.

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STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, Sept. 27.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Sept. 9	7	7	Alliance & Dublin Ord. ...	130—140*	...	...
374,000	,,	June 24	4	4	Do. 4 p.c. Deb. ...	97—102	...	99½
557,655	,,	Aug. 12	7	7	Barnet Ord. 7 p.c.	165—170	...	166
300,000	,,	Apl. 8	1/4½	1/9⅜	Bombay, Ltd.	1⅜—1⅝	...	...
178,480	Stk.	Aug. 12	9½	9½	Bournemouth sliding scale ...	222—232	...	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	168—173	...	171½—172½
489,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152	...	152
50,000	,,	June 24	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	106—111	...	110
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128	...	124½—126½
357,900	,,	Aug. 12	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	156—161	...	158—160
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref. ...	142—147	...	...
1,487,500	,,	July 8	5	5	Bristol, 5 p.c. max.	120—122*a*	...	...
120,420	,,	June 7	4	4	Do. 1st 4 p.c. Deb. ...	102—104*a*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	101—103*a*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	127—130*a*	...	...
855,000	,,	Sept. 23	8	7	British Ord.	152—157*	−2	154—155½
100,000	,,	June 7	7	7	Do. 7 p.c. Pref.	160—165	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. "B" Cum. Pref.	112—117	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114	...	...
200,000	,,	,,	...	17/6⅝	Do. 3½ p.c. Red. Deb. ...	99—101	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	June 24	4½	4½	Do. 4½ p.c. Deb. ...	83—88	...	...
626,860	,,	July 22	6	6	Cardiff Con. Ord.	127—132	...	...
237,860	,,	June 7	5	5	Do. 5 p.c. Red. Deb.	107—112	...	...
157,150	,,	Aug. 12	6½	5	Chester 5 p.c. Ord.	109—114*b*	...	...
98,936	1	Sept. 23	2/-	2/-	Colombo, Ltd., Ord.	1⅜—1⅝*	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20/—22/*	—/6	...
609,204	1	Mar. 25	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	20/6—22/6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	25/—27/-	...	...
1,775,005	Stk	Aug. 12	6	5	Commercial Ord.	100—105	...	102½—103½
620,000	,,	June 7	3	3	Do. 3 p.c. Deb. ...	87—92	−1	91
286,344	,,	Aug. 12	5	5	Do. 5 p.c. Deb. ...	121—126	...	122½
807,560	,,	Aug. 12	7	7	Croydon sliding scale... ...	151—156	...	154—154½
569,590	,,	,,	5	5	Do. max. div.	113—118	...	114½—115½
620,385	,,	June 24	5	5	Do. 5 p.c. Deb.	123—128	...	...
542,270	,,	Aug. 12	10	7	Derby Con.	180—190*c*	...	...
55,000	,,	June 24	4	4	Do. 4 p.c. Deb.	100—105*c*	...	...
239,000	,,	Aug. 12	5	5	East Hull Ord. 5 p.c. ...	109—112	...	...
181,625	,,	Aug. 12	6	6	East Surrey Ord 5 p.c. ...	129—134	...	...
175,609	,,	June 7	5	5	Do. 5 p.c. Deb. ...	123—128	...	125
19,313,481	,,	Aug. 12	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	26/3—27/3*f*	—/3	26/6—27/-
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	89—92	...	89½—90
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	106—109	...	106—107½
8,602,497	,,	June 7	3	3	Do. 3 p.c. Con. Deb. ...	88—91	...	88—89½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—118	...	114½—115
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	113—116	...	115½
270,466	,,	Aug. 12	6	6	Harrogate New Cons. ...	132—137	...	135—137
140,000	1	Sept. 23	1/7½	1/7½	Hongkong & China, Ltd. ...	1½—1¾*	...	...
213,200	Stk.	Aug. 12	6	6	Hornsey Con. 3½ p.c.... ...	130—135	...	...
5,600,000	,,	May 13	10	14	Imperial Continental Cap. ...	205—215	+5	203½—214
223,130	,,	July 22	3½	3½	Do. 3½ p.c. Red. Debs.	91—96	...	...
285,242	,,	Aug. 12	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—180	...	...
2,167,410	,,	Aug. 12	6	6	Liverpool 5 p.c. Ord.... ...	134—136*b*	...	...
245,500	,,	June 7	5	5	Do. 5 p.c. Red. Pref. ...	105—110*b*	...	...
306,083	,,	July 8	4	4	Do. 4 p.c. Deb.	103—106*b*	...	...
165,736	,,	Aug. 26	10	8	Maidstone 5 p.c. Cap. ...	182—192	...	...
63,480	,,	June 24	3	3	Do. 3 p.c. Deb. ...	82—87	...	...
75,000	,,	May 27	†10	†10	Malta & Mediterranean Metropolitan (of Melbourne)	212—222	...	...
392,000	—	Apl. 1	5½	5½	5½ p.c. Red. Deb.	100—105	...	...
231,978	Stk.	Aug. 12	5	5	M. S. Utility "C" Cons. ...	108—113	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	101—106	...	...
360,075	,,	June 24	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	123—128	...	...
125,000	—	July 1	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	97—100	...	...
675,000	,,	June 24	†13	†13	Montevideo, Ltd.	48—53	...	...
2,061,315	,,	Aug. 12	5½	5	Newcastle & Gateshead Con.	25/9—26/3*df*	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	107—108*d**	...	...
776,706	,,	June 7	3½	3½	Do. 3½ p.c. Deb. ...	100½—101*d*	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107*d*	...	...
274,000	,,	Aug. 12	5	5	Newport (Mon.) 5 p.c. max....	113—118*a*	...	...
225,000	,,	Aug. 12	7½	7½	North Middlesex 6 p.c. Con.	162—172	...	...
396,160	,,	Aug. 12	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.	160—170	—5½	...
416,617	,,	June 7	8	8	Plym'th & Stonehouse 5 p.c.	162—167	...	...
504,416	,,	Aug 12	8½	8½	Portsm'th Con. Stk. 4 p.c. Std.	170—175	...	172—174
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	108—113	...	110—112
114,000	,,	July 22	5	5	Preston 5 p.c. Pref.	106—111	...	...
321,961	1	Sept. 23	...	1/-	Severn Val. Gas Cor. Ltd. Ord.	22/—23/-*	...	...
319,510	1	,,	...	-/10½	,, ,, 4½ p.c. Cum. Pref.	21/9—22/9*	—/3	...
1,736,968	Stk.	Aug. 26	6	6	Sheffield Cons.	140—142*a*	...	...
95,000	,,	June 24	4	4	Do. 4 p.c. Deb.	102—104*a*	...	...
133,201	,,	Aug. 12	5	8½	Shrewsbury 5 p.c. Ord. ...	145—150	...	...
90,000	10	May 27	‡3	‡3½	South African	3—4	...	...
1,061,779	1	Sept. 23	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	28/—29/-*	...	27/10½—28/6
845,016	1	,,	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	22/3—23/3*	—/3	22/4½
450,000	Stk.	Aug. 12	4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Aug. 12	6½	5	South Met. Ord.	123—128	...	123—125½
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	150—152
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	107—110	...	...
1,895,445	,,	June 24	3	3	Do. 3 p.c. Deb.	88—92	−½	88
1,000,000	,,	July 8	5	5	Do. 5 p.c. Red. Deb....	114—117	...	...
209,820	,,	Aug. 12	8½	8½	South Shields Con.	171—173*d*	...	...
1,543,795	,,	Aug. 12	6	6	South Suburban Ord 5 p.c. ...	126—131	...	127—127½
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	105—110	...	...
888,587	,,	June 7	5	5	Do. 5 p.c. Deb. ...	123—128	...	124
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
647,740	,,	Aug. 12	5	5	Southampt'n Ord. 5 p.c. max.	115—120	...	...
121,275	,,	June 7	4	4	Do. 4 p.c. Deb.	100—105	...	...
350,000	,,	Aug. 12	5½	5½	Swansea 5½ p.c. Red. Pref. ...	113—118	...	...
200,000	,,	June 7	6½	6½	Do. 6½ p.c. Red. Deb. ...	98—103	...	...
1,076,490	,,	Aug. 12	6½	6½	Tottenham and District Ord.	149—154	...	150—151
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	130—135	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
334,615	,,	June 7	4	4	Do. 4 p.c. Deb. ...	101—106	...	...
369,774	,,	Aug. 12	7	7	Uxbridge, &c., 5 p.c.	150—155	...	153
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123	...	...
1,326,700	,,	Aug. 12	7	7	Wandsworth Consolidated ...	156—161	...	158—160
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	124½
1,317,964	,,	June 7	5	5	Do. 5 p.c. Deb. ...	125—130	...	127
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
158,400	,,	Aug. 12	6*g*	5	Winchester W.& G. 5 p.c. Con.	114—119	...	124

Quotations at :—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. *f*.—The quotation is per £1 of Stock. *g*.—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year. § Actual for three months.

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